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Excursionists on the Footplate

IT is some years since the fact of having made a five-shilling aeroplane flight marked a man out among his fellows. On the other hand to have ridden on a locomotive footplate remains a coveted distinction. At least, it will do so until this coming Sunday, when the Southern Railway is taking the remarkable step of offering a footplate ride to participants in a special excursion for railway enthusiasts. We do not recall a previous occasion in this country when a ticket generally available to the public (within the limits of a necessary restriction of the number issued) has conferred such a privilege, and the idea seems to go even a step further in opening railway mysteries to the public than has already been achieved by railway enthusiasts' excursions in the U.S.A. The footplate ride is to take place on a tank engine between Brookwood and Bisley, and is included in the fare of 7s. 6d. for the excursion proper between Waterloo and Brookwood. Visitors will travel from London in conducted parties by specified trains, and at Brookwood will be able to inspect a "Lord Nelson" class locomotive and an exhibition of railway working models and prints.

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Propaganda

It would be difficult to pack more comprehensive railway education into a single day than that which was imparted on the occasion of the Crusaders' Union excursion to Crewe works on Monday last. The two trains conveying the 800 boys from London were worked down to Crewe on "XL" limit timings equal to those of the fastest ordinary expresses, at scheduled speeds of over 60 m.p.h. from start-to-stop, and with maximum speeds of 80 to 85 m.p.h. For one of the trains an engine of the latest streamlined Pacific type was turned out, and other modern locomotives were on view at Crewe, with liberty to climb all over them for purposes of close examination. In the works, in the course of a tour occupying over three hours, the boys were given every opportunity for seeing all the multifarious detail which goes to the maintenance of the motive power side alone of a railway organisation. On the journey the comfort of railway travel and the excellence of railway catering were demonstrated to a party which included many who rarely, if ever, travel by train, parental motorcars being used over long distances instead. To drive home the lessons so inculcated, the special trains, on the journey back to London, were manœuvred into suitable positions for seeing the Coronation Scot streamliner in all its glory at two of the fastest points of its daily run. While a commission of this description from the promoters of an excursion is not to be despised from the revenue point of view, the way in which the various departments of the railway rose to the propaganda possibilities of the occasion is greatly to their credit.

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The Week's Traffics

Comparisons in the accompanying table are between a week this year which includes the Easter Monday bookings and Good Friday week in 1938, so that passenger bookings are well down, and merchandise and coal receipts are mostly up. Comparing the complete Easter holiday periods for the two years it will be found that passenger train earnings of the four main-line railways for the 1939 fortnight totalled £3,160,000, a decrease of £6,000 on 1938. Merchandise receipts for the 1939 holiday fortnight were £1,903,500, an increase of £98,500, and the coal traffics of £1,142,500 showed an improvement of £125,500.

	15th Week				Year to date	
	Pass., &c.	Goods, &c.	Coal, &c.	Total	Inc. or Dec.	
	£	£	£	£	£	%
L.M.S.R. ..	−216,000	+ 20,000	− 7,000	− 203,000	− 713,000	− 3·98
L.N.E.R. ..	− 90,000	+ 30,000	+ 35,000	− 25,000	− 688,000	− 5·18
G.W.R. ..	− 84,000	+ 5,000	− 7,000	− 86,000	− 274,000	− 3·69
S.R. ..	−108,000	—	+ 3,000	− 105,000	− 63,000	− 1·11

Passenger train takings showed increases of £6,193 on the Great Southern, £3,550 on the Great Northern, and £1,902 on the Belfast & County Down.

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The World's Fastest Steam Train

In these days of ever-increasing speeds, no specific train, however fast, can expect for long to retain the blue riband as the "fastest train in the world." It was only a few months ago that the Milwaukee Company of the U.S.A., in putting its new morning Hiawatha service into operation, introduced with it a run over the 78·3 miles from Sparta to Portage at 74·6 m.p.h. From the introduction of the summer timetables in May, however, the Belgian National Railways go one better than this by putting into service new *rapides*, two in each direction daily, which, as mentioned on page 654 of this issue, are booked to cover the 70·8 miles between Brussels Midi and Ostend Quay in the even hour, and not only so, but will include in this schedule an intermediate stop at Bruges. The down trains are thus timed to run the 57·7 miles from Brussels to Bruges in 46 min., at 75·3 m.p.h. from start to stop—the fastest start-to-stop schedule hitherto undertaken with steam power. It is true that from the point of view of demand on tractive power, the American train has by far the harder task of the two, as the Belgian trains, with seating for 12 first class and 100 second class passengers, will tare only 163 tons as compared with the Hiawatha's empty weight of 430 tons; but this is no reflection on the enterprise of the Belgian National Railways in pursuing their high-speed programme, despite congested lines through densely-populated country, with

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such tremendous vigour. Belgian railway speed, indeed, furnishes a fitting complement to that of her neighbour, Holland.

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Overseas Railway Traffics

A welcome increase is shown by the Buenos Ayres Great Southern in its traffic return for the past week after a series of decreases. The three other large British-Argentine companies have again recorded advances. Since the turn of the half-year the Central Argentine has reduced its previous decrease by no less than £372,906. Improvement on the Buenos Ayres & Pacific and on the Buenos Ayres Western had begun about the middle of November. Since that date the Pacific has reduced its decrease from £165,445 to £50,683, and the Buenos Ayres Western from £138,711 to £17,680.

	No. of Week	Weekly Traffics £	Inc. or Decrease £	Aggregate Traffic £	Inc. or Decrease £
Buenos Ayres & Pacific ..	42nd	112,221	+ 12,779	3,652,299	— 50,683
Buenos Ayres Great Southern ..	42nd	158,809	+ 15,012	6,028,287	— 312,965
Buenos Ayres Western	42nd	59,429	+ 16,749	1,885,794	— 17,680
Central Argentine	42nd	131,405	+ 23,440	4,901,765	— 216,641
Canadian Pacific .. .	15th	499,800	— 12,000	6,855,400	— 165,800
Bombay, Baroda & Central India	1st	259,650	— 15,075	259,650	— 15,075

The Argentine North Eastern and Entre Rios Railways have increases to date of £20,246 and £52,286.

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L.M.S.R. Goods Claims Decrease

A complete review has now been made of the freight claims position on the L.M.S.R. during 1938, and according to *On Time*, the journal of the company's Operating Department, there was an encouraging decrease in claims on consignments by goods train. Freight consignments last year were 4·9 per cent. below 1937, but claims decreased in notably greater proportion by 13·9 per cent. This is sufficient to counteract a small increase in claims on passenger train traffic, making the combined result for the year a fall of 12·3 per cent. in the number of claims received. Reducing claims for damaged goods is a problem that has evoked some original ideas among the railways in recent years. A contribution from the L.M.S.R. Research Department was the shock-absorbing wagon, described in our issue of August 20, 1937. In this vehicle sets of rubber springs act as a buffing element between the chassis and the body. Mechanical ingenuity, of course, cannot entirely supplant human care, and psychological appeals to the staff are equally carefully considered by the railways, whether in the form of posters, or, as in one case, by the issue of a jig-saw puzzle that on being put together formed an admonitory message.

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Staff Safety on the Pennsylvania

Substantial advances in safety were recorded by the Pennsylvania Railroad in 1938, when accidents to employees per million man-hours worked were reduced by 14 per cent. The entire system showed only 5·88 accidents per million man-hours, as compared to 6·84 in 1937. Each million man-hours is the equivalent of 400 men working full time for a year. An annual safety contest is held on the system, and last year, in the competition between the major operating regions for the best results in all departments, the winner was the Western Region, with headquarters at Chicago, showing 3·80 accidents per million man-hours. Among the general divisions, which are the operating units next in size to the regions, the award in the all-department contest went to the South-western division, based on Indianapolis, with 3·50 accidents per million man-hours. Among "no-accident" returns were those sent in by the Toledo Division in the Maintenance of Equipment contest; by the Logansport Division in the Station Department contest; by Philadelphia in the Engine Service Department contest; and by Cincinnati for Maintenance of Way.

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Ground Signal Aspects

In the multiple-aspect power signalling installations opened during the last ten or twelve years in Great Britain various types of ground shunt signal have been used. These have included colour-lights, position-lights, banner signals, and a derivative from them, the white plate with coloured bar on it, floodlit at night. Three-position ground signals, with coloured lights, have long been in use at Victoria (Eastern Section), but are to disappear in favour of the floodlit variety. No other installation in this country has three-position shunt signals, but the principle, using the position-light design of signal, has been adopted as standard for some time in the Scandinavian countries. This diversity of shunt signals has met, not unreasonably, with criticism in various quarters, and it must be admitted that greater uniformity is desirable, although such signals do not have to be read by drivers at speed. Some have enquired why the colour-light ground shunt has tended to disappear here in favour of other types. The reason, we think, has nothing much to do with design or the possibility of phantom aspects being seen, but comes from the impossibility of giving the three signalling colours the same meaning in ground as in running signals, thus leading to a contradiction from which signals without coloured lights are free.

* * * *

Chesterfield: Town of the Crooked Spire

Although Chesterfield is the centre of the North Derbyshire coalfield, there is not a colliery in the borough. The town, which is widely famed for the crooked spire of its ancient church, is of interest to all railwaymen, for in Holy Trinity Church there George Stephenson was buried in August, 1838. He had lived at Tapton House, Chesterfield, for about twelve years prior to his death; the house, which was presented to the town by Mr. Markham in 1925, is now a school. The transport developments of the town are briefly reviewed by Mr. J. G. Peabody in the current issue of the *L.N.E.R. Magazine*, in which the author mentions that in 1777 the first barge went into the town up the newly-constructed canal that connected Chesterfield with the Trent at Stockwith. This canal was taken over by the railway when the Manchester, Sheffield & Lincolnshire line was constructed; it is now disused to the west of Worksop. When the Central station was opened on June 4, 1892, there were about 13,000 inhabitants in the borough, but the figure is now about 67,000, and there are about 80,000 in the Chesterfield Rural District. Nearly all the L.N.E.R. collection-and-delivery goods traffic and parcels traffic is dealt with at this station. The Lancashire, Derbyshire & East Coast Railway, which terminates at the Market Place station, was opened on March 8, 1897. It was taken over by the Great Central Railway on January 1, 1907, and this station now deals principally with station-to-station traffic, which requires storing, and with coal and traffic for radial delivery.

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The Flying Tasman

"Hardly a square deal" will be the comment of the justice-loving British public on the railway news from Tasmania reported on page 658. Animated by the desire to make its services more attractive, the Tasmanian Railway Department has introduced streamlined trains for the

Hobart—Launceston journey. Unfortunately, travellers have been given only the substance of streamlining, without the spirit, for the new trains are subject like all other railway traffic in the island to a maximum speed limit of 45 m.p.h. In other words, even with the best intentions the streamliners can fill the unforgiving minute with only three-quarters of a mile of distance run, which hardly seems to be giving a fair show to their roller-bearings and rubber shock-absorbers. Considering that the 134-mile journey from Hobart to Launceston involves maximum gradients of 1 in 40 and 5-ch. radius curves, the speed-limit is explicable—somewhat more so than the streamlining. It is reported that an epidemic of infantile paralysis prevented public response to the innovation being fairly gauged. At least it reduced the chances of speed-seeking optimists contracting creeping paralysis in the streamlined trains.

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G.W.R. Carriage Depots

Working the extra traffic into and out of Paddington at Easter was made smoother by the fact that the improved rolling stock marshalling and storage accommodation at Old Oak had been completed in time for the holiday rush. Work on the carriage depot was in progress for five years, and today Old Oak has 15 miles of sidings, 30 roads inside carriage sheds, which cover twice the area of Paddington station, and systems of floodlighting suitable for ordinary night or fog conditions. The passenger train marshalling yard is the largest in Great Britain. Two independent lines have been provided for working empties between Paddington and the depot, with automatic signalling throughout the 3½ miles. The G.W.R. Traffic Department is now well equipped with accommodation for cleaning, storing, and marshalling passenger trains. In addition to Old Oak, the department has such facilities at Ebbw Junction (Newport), Cannock Road (Wolverhampton), Tyseley (Birmingham), and Canton (Cardiff). Another recent addition has been the shed at Cherry Orchard, near Caerphilly, South Wales. This, however, is less a running depot than a storage shed for new stock until such time as holiday or summer traffic requires it being placed in service. Upwards of 100 coaches can be stabled.

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Forty Years' Progress in Efficiency

In an article on page 648, Lord Monkswell has contributed an interesting summary of outstanding feats of locomotive performance over the period of years since the end of last century. These performances are selected so as to represent fairly uniform efforts sustained for sufficient length of time to enable the horsepower developed to be roughly estimated, and Lord Monkswell shows that this has increased from 20 h.p. per ton of engine weight about the year 1895 to 32 h.p. per ton in the case of the most recent designs. These figures are presumably intended to represent indicated horsepower, as Lord Monkswell has based his calculations on assumed figures for train resistance, plus an allowance of 32 lb. per ton at 50 m.p.h. for the resistance of the engine (without tender), rising to 48 lb. at 80 m.p.h. This rough-and-ready method of calculation necessarily takes no account of variations in the internal mechanical resistance of the engine, which stationary plant tests have shown to be very variable, and the most satisfactory basis for all comparative estimations of locomotive power is the horsepower exerted at the rim of the driving wheels. Nevertheless, Lord Monkswell's figures do give a convincing picture of what the progress in locomotive efficiency during the last 40 years really means. They are a complete answer to the assertion that thermal efficiency is of secondary importance in the steam locomotive. For, disregarding altogether the amount of fuel burnt to obtain each horsepower-hour, we see that the improvement of efficiency over this period enables the modern locomotive to give half as much power again as it could have done if development had merely been in the direction of increased size and mechanical improvements. In short, the high speeds and paying train loadings of today would have been quite impossible without this radical improvement in the thermal efficiency of the steam locomotive.

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Locomotive Slipping Tests in America

The introduction of high speed trains on railways in the United States and the use of more powerful locomotives have accentuated the dynamic forces on the rail resulting principally from counterbalancing conditions. The subject of rail damage was brought forcibly to attention with the introduction of the New Haven 4-6-4 express locomotives in 1937, and the suggestion was made that this might be partly due to the roller-bearing axleboxes fitted to the driving wheels, an innovation on the railway referred to. It was therefore decided to make slipping tests on greased track, to produce high rotative speed for the driving wheels, with two similar 4-6-4 locomotives, one having plain and the other roller-bearing driving axleboxes. These tests did not confirm the suggestion that roller-bearings were a contributory factor, but they did lead to the decision to reduce the overbalance on the main pair of wheels from about 200 to 100 lb., a step which has overcome the difficulties associated with damage to the rails. Slipping tests were also made with a variety of Chicago, Burlington & Quincy, New York Central, and Santa Fe locomotives, and were described recently in a paper to the New York Railroad Club by Messrs. T. V. Buckwalter and O. J. Hoyer. The tests showed that if reciprocating and revolving parts are kept down to the lowest possible weight, both by careful design and the use of high tensile materials, and if high overbalance for the reciprocating parts is avoided, there need be no risk of rail damage by heavy modern locomotives even at the highest speeds.

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These "Litter-bugs"

By a process of whimsical but not entirely extravagant reasoning, we conclude that quantities of our fellow-beings must have spent at least two-thirds of their waking hours in feeding birds, pelting happy couples, and being "hares" in paper-chases. How else can one account for the ineradicable penchant of the masses for leaving behind them, in the face of plainly enunciated dissuasions and deterrents, trail after trail of unsightly, and at times noisome, debris in the course of their journeyings? It is no exaggeration to state that, whenever we homeward plod our weary way by late Underground train, our carriage bears unmistakable evidence of having been recently maltreated by hordes of beanfeasters *de luxe*, and our hearts immediately go out to the board's scavenging brigades, who must, in order to render next day's rolling stock habitable, take up of the fragments "litter-ally" twelve basketsful. Now, the authorities of London Transport are not exactly backward in "decontamination," and we are praying fervently that soon they may catch one of these vandals red-handed, compel him to don "full regimentals" and put him to the task of super-cleansing according to the blessed word and ordinance of A.R.P. regulations. Such punishment, magnificently fitting the crime, would surely discourage the others, while for an affliction which the French have pithily described as *nostalgie pour la boue* we can think of no more efficacious and salutary cure.

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"Railways, Roads, and the Public"

AN interesting correspondence has been passing in our contemporary *The Accountant*, as the result of a leading article under the above heading published in its February 11 issue. Among the correspondents are Lord Stamp on February 18, and "Railway Accountant" on April 15. The following paragraph appears to have been the originating "bone of contention":—

The capital structure of the British railways at the time of their grouping, and also the standard revenue figures, were based on estimates of far better conditions of trade at home and abroad than have actually prevailed for most of the sixteen years since the grouping scheme came into force. Whether or not the framers of those estimates might at the time have pleaded justification need not concern us today. But in view of the existing position and of the general outlook, the railway companies might be well advised to consider the reduction of their capital so as to bring nominal values more into line with market prices. Since the armistice, capital reduction has been carried out in all our major industries; more forcible arguments than have as yet been adduced are needed in support of the contention that railway capital—which has been written down in the past—should today be immune from the process.

At the time of grouping there was no assessment of the absolute or intrinsic value of railway undertakings for capital structure purposes by reference to their current or potential earnings, although there were certain necessary adjustments *within each group* by reference to *relative earnings* to enable exchanges of stock to be made on an equitable basis. A study of the capital accounts of the four large railways will show, it is suggested, that their structure is far from unsatisfactory. The rates of interest payable on the fixed interest stocks are by no means high (varying from 2½ per cent. to 5 per cent.), and many of the higher rated stocks were originally issued at a premium so that the effective rate is correspondingly lower. In the aggregate, premiums amounting to over £33 million received on the issue of these stocks have been credited to capital account. Further, very substantial expenditures on extensions and other capital works have been financed without recourse to further borrowing by the use of the companies' internal resources. In short, the total effective capital employed exceeds the nominal capital by many millions of pounds. It may also be noted that, arising from the railway practice of charging "like with like" renewals to revenue (as opposed to the more usual commercial method of writing out the old asset by regular depreciation and then re-charging capital with the new), the whole of the capital expenditure is on the basis of original cost, with the result that a very large proportion stands at the pre-war level of prices. Again there is a continuous process of writing out of capital displaced assets which have not been reproduced, and other instances of what might be regarded as "dead" capital. Thus the existing issued capital of the railways appears to be more than amply covered by sound assets which obviously could not be acquired or reproduced at anything like so low a figure as that reflected in the capital account. From this point of view therefore there appears no reason for writing down the capital.

As regards the reference to the "capital reductions carried out in all our major industries" and its inference that they provide a precedent which the railway companies ought to follow, it may be objected that in the absence of full information as to the circumstances of each of the companies referred to and the individual reasons for their capital re-organisation it is impossible to agree that their experience is at all relevant to that of the railway companies or that their action provides any sound precedent which the latter should follow. Certainly the writing down of capital may be a highly desirable procedure in the case of a concern where a permanent loss of subscribed capital is apparent, *e.g.*, through the cesser of operation of some branch or section of the business or through the accumulation of a series of substantial losses which, in the absence of available free reserves, stand to the debit of the profit and loss account. In such cases recourse might well be had to reducing the capital in order that profits subsequently earned might be immediately available for dividend and that such profits would be referred to a more accurate figure of the capital employed in the business. It will not be forgotten that, during the war and the immediate post-war period, many concerns enjoyed abnormal prosperity owing to the high profits then available to industry and that, hoping for a continuance of these happy conditions, some embarked on a programme of extensions and plant re-organisation at very high cost which necessitated substantial additional finance. Certain concerns were floated as public companies with capitalisations which subsequent events proved were unduly high, and even where borrowing only was indulged in, the high money rates then obtaining imposed a subsequent heavy burden on the companies who had thus issued prior-charge stocks. The "aftermath" of slump and prolonged period of depression found many of these concerns with accumulated losses which in fact represented severe inroads into their capital. None of the foregoing conditions applied to the railways—they received no benefit from the abnormal war-period prosperity for, although they carried greatly increased traffic, their remuneration was stabilised on a pre-war basis; there was no wartime or post-wartime inflation of their capital; they have been able to earn sufficient profits even in the most depressed years to meet the interest on their prior stocks (and generally their preference dividends), and none of them has any adverse balance standing on its net revenue account; if a physical valuation of the whole of the land properties and other assets of the railway companies could be made, it would doubtless considerably exceed the total subscribed capitals. Surely such a position might well be the envy of many commercial concerns.

Apart, however, from these considerations, it may reasonably be asked (as, in effect, is asked in the letter of "Railway Accountant"), who were the beneficiaries that the writer of the article had in mind in suggesting a reduction of railway capital. Surely not the railway stockholders as a whole; nor presumably is it seriously suggested that any one class of stockholders should gain at the expense of another class. There is no indication as to how the proposed writing down should be achieved or what practical advantage to the companies such a process would give. Obviously the mere writing down of capital is no magical or miraculous process whereby prosperity can be made to return to a concern, nor does "robbing Peter to pay Paul" increase the profits of a partnership of which they are joint partners. It is undoubted that the pre-ordinary stockholders, secure in their legal rights, would not voluntarily submit to being deprived of any of such rights and therefore, if these holders are ruled out of the list of victims, only the equity stocks remain for the proposed amputation. But what practical effect would be obtained or what benefit to anyone would accrue from such a mere bookkeeping entry? It is true that such writing down would produce the illusion that a higher rate of dividend could be paid,

but as pointed out by " Railway Accountant " the true position would thereby be " disguised," as actually no more would be available for distribution than would have been available had there been no writing down. In this connection it is important to bear in mind that only about 25 per cent. of issued railway capital is in the form of ordinary stock, and the result is that, as compared with a company where the prior and equity stocks are say on a fifty-fifty basis, any variation in the net revenues of the railway companies has a disproportionate effect on the yield on the ordinary stocks, and a reduction in the nominal value of the latter would accentuate this tendency. If, therefore, the railway ordinary capital were substantially reduced by the proposed writing down, any material improvement in the net revenue position might easily result in such an apparently high percentage return being shown as to embarrass the companies *vis-a-vis* their critics. The question thus remains, " who then is supposed to benefit? "

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Railway Wages

" THE public must be prepared for serious trouble if the railway companies maintain their present attitude. This is not a threat but a warning." These words appeared last week in an article written by Mr. Marchbank, the General Secretary of the N.U.R. in the *Railway Review*, the official union journal. In this article Mr. Marchbank comments upon the rejection by a special general meeting of his union of the recent decision (No. 5) of the Railway Staff National Tribunal. In our issue of March 3 we printed the findings of the tribunal upon the claims of the three railway trade unions for improved wages and conditions of service. In view of the magnitude of the claims, and the financial position and prospects of the companies, the tribunal found against the majority of the claims but awarded two concessions, both affecting conciliation grades, the one relating to the Sunday turns of duty and the other to the spread-over agreement. On page 402 of our issue of March 10 we pointed out that " as is usual the decision will be considered by all parties." On April 4, by a large majority, a delegate conference of the membership of the N.U.R. met in London, rejected the tribunal's decision; after discussing a proposal for strike action, a resolution was carried instructing the executive immediately to approach the companies for the granting of the unions' claim for a minimum rate of pay of 50s. a week for all adults in conciliation grades. Mr. Marchbank declares that " the union is quite determined to obtain this minimum for the lower-paid membership and cannot let it stand over indefinitely."

Let us consider the position. In the first place it should be remembered that this claim for a 50s. minimum rate of pay is not a new one. Such a claim was put forward to the tribunal in July, 1937. Much carefully prepared evidence was given by Mr. Marchbank in support, and the rebutting arguments submitted by the companies' spokesmen were equally carefully examined by the tribunal, which came to the conclusion that in the then financial situation of the companies the cost involved was " prohibitive." Nevertheless, with a view to relieving the position of the lowest paid workers the tribunal included in the Award (Decision 3) two special provisions. In January last when the tribunal again considered an identical claim it was at pains to emphasise that it had given the claim " sympathetic attention " and even went so far as to express the opinion that " a strong case has been presented for making an increase upon the lowest rates a first claim as soon as the financial position makes any substantial concession possible." The great extra annual cost of conceding the claim remained, however, as an insuperable obstacle. The direct cost was stated to be £1,087,000 a year, and with the indirect cost the figure would be much higher. In March, 1938, there were approximately 101,000 conciliation staff *rated* at less than 50s. a week, but the number of adult male conciliation staff whose *earnings* were below 50s. a week was very much less, and it was stated in evidence by the companies advocate that the number did not exceed 58,000. It was demonstrated, too, that the rates of pay of the various grades of railway employees have always been fixed in relation to the responsibilities of those grades. If the proposal of the union were adopted, the present relationship between the various grades would be altered. All grades rated below 50s. a week would be paid the same rate in common with those at present rated at 50s. a week, with the result that 110 grades, covering 122,000 men, or nearly 40 per cent. of the conciliation staff, which in the past have been variously rated, would all be on the same rate of pay. It is obvious that the proposal could not be adopted without involving consequential increases for other staff.

The tribunal, in Para. 7 (1) (i) of Decision 5, decided that the claim could not be granted " at a time when traffic receipts, and still more net earnings, have fallen so greatly, and when the movement is still downwards." It is this conclusion which the N.U.R. special general meeting now contests, and so that same claim is to go back to the companies, and, presumably, through the usual stages of the Machinery of Negotiation to the tribunal, with an intimation from the union that despite falling receipts, it must be granted or else there will be " serious trouble." We must, however, emphasise that railway traffic receipts for the first 15 weeks of this year compared with a corresponding period last year show a decrease for the four main-line companies of £1,738,000. How then can it be expected that the claim of the N.U.R. can be met? But this is not all. On April 5 a delegate conference of the A.S.L.E. & F. rejected the tribunal's decision and decided to re-open negotiations with the companies on the *whole* of the claims upon which the tribunal gave a decision only six weeks ago. The companies may well ask if there is to be no finality. The tribunal's decision was no hasty one for, as we have already shown, after the public hearing, which lasted five days, the tribunal took a month to sift and examine evidence and reach their conclusions.

The decision of the N.U.R. to set aside the concessions granted in Decision 5 in order that they might concentrate on their 50s. minimum claim is, perhaps, understandable, and does indicate a singleness of purpose. Had the other unions decided to abandon, for the present at any rate, their own particular claims, and join together with the N.U.R. in endeavouring to persuade the companies to give preference to the 50s. minimum claim so soon as it becomes financially practicable to do so, the idea might well have gained some measure of support from the general public. Such a move would have shown a unity of aim which might conceivably have brought nearer the raising of the existing minimum rate of the lowest paid grades. We must not forget, however, that there is yet another group of staff which is demanding, among other things, a 50s. minimum, and that group is the railway workshop staff, numbering close on 100,000. Nor must it be overlooked that the wages of railway shopmen are paid from the same funds as those from which conciliation and salaried grades are paid; also, that the standard of railway net revenue is the same in each case. The shop-

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men's claims, which are dealt with through a separate scheme of machinery of negotiation, are now to go to the Industrial Court for determination. It is many years since this court was called upon to arbitrate upon claims concerning the wages and conditions of railway shopmen, and the forthcoming proceedings will be watched with great interest, not only in railway circles but in the engineering industry generally.

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The Railways of Northern Ireland

"WHAT the Railways Mean to Northern Ireland" is the title of a little pamphlet issued by the Belfast & County Down and Great Northern (Ireland) Railway Companies, and the L.M.S.R.-Northern Counties Committee. It presents a convincing case against the fallacy that the railways in Northern Ireland have outgrown their usefulness and shows that they remain indispensable in the public interest. A particularly interesting feature of the figures given in the pamphlet for the year 1938 is that in the case of the Great Northern Railway they are in respect of the Northern Ireland portion of that company's system. The railway companies have also made it clear that in their view a public road transport system is also essential in the interest of the public both for passenger and merchandise traffic and that the two forms of transport should work in conjunction. Financial results for 1938 are shown in the accompanying table:—

	£
Passenger receipts	553,000
Merchandise receipts	601,000
Miscellaneous receipts	33,000
Total receipts	1,187,000
Maintenance expenditure	418,000
Operating expenditure	659,000
Other expenses	116,000
Total expenditure	1,193,000
Railway net deficiency	6,000
Other net receipts	24,000
Total net receipts	18,000

In this table the passenger receipts are made up as to £458,000 from ordinary tickets, £80,000 from season tickets, and £15,000 from workmen's tickets. To the merchandise receipts parcels and mails contribute £148,000, goods £333,000, minerals £20,000, coal and coke £41,000, and livestock £59,000. Maintenance expenditure includes £204,000 on way and works and £214,000 on rolling stock, and operating expenditure £300,000 in locomotive running expenses and £359,000 in traffic expenses. Read in conjunction with the statistical figures this table significantly shows what a meagre return the railways receive for the great service they render to the public. Statistical results for 1938 follow:—

Passenger journeys	13,822,000
Passenger miles	276,000,000
Average fare per mile	0·48d.
Merchandise, tons	683,000
Minerals, tons	94,000
Coal and coke, tons	174,000
Livestock, number	538,000
Total passenger and freight engine miles	6,100,000
Steam locomotives, number	206
Diesel oil locomotives ,,	2
Diesel oil and petrol railcars, number	12
Passenger carriages, number	575
Seating capacity, seats	34,700
Wagons, number	6,250
Track miles	1,035
Route miles	710
Staff employed, number	5,194

The annual wages and salaries bill of the railways is over £750,000. In 1938 the payroll represented a distribution at the rate of £14,517 a week. This money is divided amongst: 1,766 signalmen, porters, guards, &c.; 967 gangers, platelayers, &c.; 786 engine drivers, firemen, &c.; 629 fitters, joiners, &c.; 737 clerical and administrative staff; and 309 hotel employees. The Northern Ireland railways are good customers of Great Britain, and many British miners are regularly employed in mining the 180,000 tons of coal annually consumed by the locomotives, workshops, offices, and hotels, and by the L.M.S.R. cross-channel steamships serving Northern Ireland. Annual purchases by the railways of Northern Ireland are as follow:—

Coal (tons)	114,000
Timber (cu. ft.)	105,000
Ballast (cu. yds.)	26,000
Rails (tons)	2,000
Number of sleepers	78,000
Paint and varnish (tons)	115
Suits of uniform	3,500
Lubricating oil (gallons)	90,000
Petrol or oil fuel (gallons)	206,000
Total purchases of stores and materials	£518,000
Annual expenditure on advertising Northern Ireland as a tourist centre	£11,000

Several now famous holiday resorts along the Northern Ireland Coast owe their place on the tourist map to their development by railway enterprise. Over long distances the speed, comfort, and reliability of railway travel is unrivalled and for residential traffic and over short distances where traffic density is heavy, railways are indispensable. On a peak day at Easter or during the July holidays the railways in and around Belfast carry as many as 50,000 passengers. A volume of traffic such as this, or even the regular suburban traffic, would, if it could be placed on the roads, make conditions chaotic. The technical equipment of the railways is continually being improved. Internal-combustion railcars and locomotives have been introduced in place of steam trains for local traffic at several points. These enable more frequent and more economical services to be given. New and improved locomotives and carriages, including dining and buffet cars have been provided for the Belfast—Dublin expresses. Further cuts in the journey times between Belfast, Portrush, and Derry have been made. Construction of the Greenisland loop line, at a cost of about £250,000, including the largest reinforced-concrete railway viaduct in the United Kingdom, has materially contributed to this and other accelerations on the Northern Counties system. Through train services such as Dublin—Portrush and Larne—Derry save passengers the inconvenience of transfer. Through excursion trains are also run between Bangor and Dublin and between Portrush and Dublin. With all these developments there has been only one fatal accident to a railway passenger in Northern Ireland during the last four years, in which period passengers travelled more than 1,000,000,000 miles. In conclusion, the pamphlet points out that no other form of transport can with equal convenience, reliability, and economy meet the public needs for long distance, heavy residential, holiday, and excursion traffic, and that the railways are a main artery of national defence in the event of war. Reliance on road transport alone would damage the tourist industry.

* * * *

San Paulo (Brazilian) Railway Co. Ltd.

ON the main line of 86½ miles on the 5 ft. 3 in. gauge from the port of Santos inland to Jundiahy the traffic receipts showed in the year 1938 an increase in currency of 8,443 contos or 6·28 per cent. in comparison with 1937. In sterling they amounted to £1,638,318, a decrease of £29,616 or 1·78 per cent. Working expenses on the main line increased from £1,142,214 to

£1,174,318 and were 71·68 per cent. of the gross receipts, as compared with 68·48 per cent. in 1937, and net revenue of the main line was £61,720 lower, at £464,000. On the Bragantina section of 67 miles (metre gauge) there was a loss on working in 1938 of £10,546, against £7,943 in 1937. The average rate of exchange at which remittances were made during 1938 was 2·7592d. for the milreis, as against 2·97877d. for 1937. The operating ratio for the whole system in currency was 72·70 per cent. in 1938, compared with 69·39 per cent. in 1937. There was an increase of 927,226 paying passengers, with greater numbers both in first class and second, but because of the lower rate of exchange the £279,271 passenger receipts in sterling showed a decrease of £5,609, of which £2,512 was in first class. In general merchandise, coal, &c., there was an increase of 215,813 tons. The amount of exported coffee was 745,979 tons in 1938, against 586,233 tons in 1937. Receipts from merchandise traffic amounted to £1,262,269, an increase of £9,995, but livestock receipts were £8,338 lower. The general financial position is indicated in the accompanying table.

Income from investments, &c., in 1938 includes £72,279 transfer from bridge renewal fund, and £23,397 transfer from rolling stock replacement reserve. Among "other charges" are £102,653 transfer from rolling stock replacement reserve, £61,928 payable to the associated road company under agreement, and £45,000 to income tax and N.D.C. The dividend of 2 per cent., tax free, for the year 1938 on the ordinary stock compares with 4 per cent. for 1937, 5 per cent. for 1936, and 2½ per cent. for 1935 and 1934. It is noted in the report that the Mayrink—Santos line of the Sorocabana Railway, which was provisionally opened to general goods and cattle traffic on December 10, 1937, extended the service to include parcels traffic as from August 1, 1938.

	1937	1938
	£	£
Gross receipts	1,691,984	1,661,192
Expenditure	1,281,346	1,316,764
Net receipts	410,638	344,428
Income from investments, &c. ..	318,236	127,843
Total net income	728,874	472,271
Debenture interest and other charges	530,678	337,849
Dividends	170,000	110,000
Brought forward	33,827	62,023
Carried forward	62,023	86,445

LETTERS TO THE EDITOR

(*The Editor is not responsible for the opinions of correspondents*)

"Fair Treatment for the Railways"

c/o Nigerian Railway,
Ebute Metta,
Lagos, Nigeria, March 13

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—It is with diffidence that I enter the lists on such a tremendous subject as "fair treatment for the railways." I have been intimately connected with railways for 43 years however, and am saturated with the subject. The matter causing my letter is dated November 25, 1938, pp. 916 and 917. I was really shocked to think that such an enormous concern as the railways, after over 100 years, all of which were spent in intimate contact with the public, should be so little understood that such humiliating action should be necessary. Do the railways not employ advertising specialists? Why is so little and such ineffective advertising done. In your editorial of November 11, page 809, you give an instance of ignorance by presumably educated people.

I suggest that the railway authorities sit at the feet of those responsible for advertising such diverse subjects as processed coal, beer, &c.

Railway advertising appears to be confined to:—

(*a*) Populating dormitory areas and playgrounds.
(*b*) Special luxury trains.
(*c*) Very expensive but very debatable value in *art* posters. (I italicise "art" and leave it at that.)

Come all railways—tell us about it *all*. You know and I know, and so do all the other railway people—but their next door neighbours don't. Do they advertise in the *Daily Express*? Doubtful, or the criticism would not have been quite so rude.

Another value of accurate advertising besides its well-known propaganda value is that it exposes to the management weak points that would be better not advertised, and therefore better improved.

This letter perhaps is not intended for publication; you may think it too critical for your non-controversial paper, but your attitude about the versatile containers shocked me as much as the position in which the railways are in. *Quis custodiet ipsos custodes*? Has the one authority no policy of advice to help, only documentation of trends and results?

Yours faithfully,
N. MANSEL LEWIS

[Our overseas correspondent is evidently not aware that the British railways do advertise extensively in the *Daily Express* and in fact in all the "national" newspapers; also that the said newspapers pride themselves that they cannot be "bought." If advertisements were accepted to stifle criticism the papers would be practising a form of blackmail. —ED. *R.G.*]

"Northampton Vindicated"

60A, Green Lane,
Northwood, Middlesex
April 15

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—The most recent book dealing with the London & Birmingham Railway is the reprint in book form by *The Times* newspaper of the L.M.S. centenary number. This was, I understand, compiled from original documents, and on page 15 the following statement is made, "It seems that a part of the people of Northampton objected to the railway and in deference to their objection the line was to skirt Northampton and go through some very difficult country to the left." As shown by Mr. R. A. Dane in your issue of March 31 last, Robert Stephenson writing in 1857 stated that Northampton had begged that the railway might be kept away from the town, and as he was intimately concerned with all the surveys he must have known the facts.

Miss Wake in her pamphlet "Northampton Vindicated" gives as an appendix a list of works containing mention of Northampton's opposition, published from 1839 to 1931, but from the list omits all reference to "Our Iron Roads" by F. S. Williams, the first edition of which was published in 1852 and has the following paragraph (page 38) "The London & Birmingham line was thus compelled to change its intended route through Northampton, and to keep at a respectful distance; lest, said some of the worthies of that town, the wool of the sheep should be injured by the smoke of locomotives (though they burn coke); and therefore—philanthropic souls!—they required that the purity of their fleeces should be preserved unsullied from the plutonic cloud, by giving the benefit of it to the farmers of Blisworth and its neighbourhood." Williams is the only author who gives a reason for the opposition.

Yours faithfully,
REGINALD B. FELLOWS

XUM

PUBLICATIONS RECEIVED

Pioneering Days on the Hill Section of the Assam-Bengal Railway : A Correction.—In the review of this work in our issue of April 7, the price was shown as 6s. due to the book being marked -/6/-. Actually, the Managing Director of the line informs us, the price is 1s. net in this country and 6 annas in India. We hope the moderate price will lead to its being widely read.

Workmen's Compensation, Vol. 1.—Social and Political Development. By Sir Arnold Wilson, M.P., and Prof. Hermann Levy. London : Humphrey Milford, Oxford University Press, Amen House, Warwick Square, E.C.4. 9½ in. × 6¼ in. 328 pp. Price 10s. net.—In December, 1938, a Royal Commission was appointed to examine and report upon the question of Workmen's Compensation, so the appearance of this book may fairly be said to be timely. The authors set out with commendable clarity the historical origins, Parliamentary discussions, and departmental deliberations which form the background of the present law upon the subject. A preface by Sir Arnold Wilson observes : "If this book helps the Royal Commission—and we hope a far wider circle—to realise in the light of history how relatively meagre have been the results of sixty years' effort, how much remains to be, and can be, done, we shall have accomplished our task." There is then given an interesting account of industrial accidents and the rise of industry from the earliest beginnings until 1880. This account, as with the other chapters in the book, is carefully documented and leads on to a discussion of Employers' Liability and the beginning of Workmen's Compensation, including the basic principles of the 1897 Act of Parliament, which came into force on July 1, 1898. Within five years a Parliamentary committee was appointed to pursue fresh inquiries and to propose amendments to our extensions of the law as it then stood.

As a direct outcome of this inquiry, Parliament passed the Act of 1906, which introduced some entirely new principles in labour legislation, or, at any rate, provided for new applications of old principles. However, as the authors observe, "defects soon became apparent and were remedied as far as was possible without raising large and controversial issues by a series of minor enactments," but in 1919 a departmental committee was appointed by the Home Office, under the chairmanship of Holman Gregory, with wide terms of reference. The authors devote a considerable section of their book to an analysis of the committee's report and to Mr. J. H. Thomas's Bill of 1923, which followed and was dropped. The concluding chapters deal with legislation of 1923-34, and the book, which contains an excellent bibliography and some illuminating statistics, can, at the modest price of only ten shillings, be earnestly commended to all persons interested in the social and political development of Workmen's Compensation.

Great Engineers. By Professor C. Matschoss. Translated by Dr. H. Stafford Hatfield. London : G. Bell & Sons Ltd., York House, Portugal Street, W.C.2. 8¼ in. × 5½ in. × 1¼ in. 381 pp. Illustrated. Price 12s. 6d. net. —This volume is a translation into English of a work which has already made its mark in Germany and is the result of the studies in the field of technical history of a well-known German professor. His object is to give a brief account of the outstanding men in their respective generations who have devoted their energies to applying in the service of man forces and materials suited to a given task, and he has spanned a period of approximately 5,000 years in making his selection. We know very little concerning the personalities of engineers of antiquity, but the works still in existence prove that they achieved great things. Professor Matschoss has divided his book into three main sections dealing respectively with (I) the great engineers of antiquity ; (II) from the fall of the Roman Empire to the development of modern technology in the 18th century ; (III) great modern engineers. In the earliest section he has been placed under the handicap that the engineers of antiquity are mainly anonymous and he points out that those whose names have survived are not necessarily the greatest of their particular period but those who wrote of engineering achievement and thus perpetuated their names. Thus the famous Hero of Alexandria may have been a text-book writer rather than an engineer of the first rank. Incidentally, Professor Matschoss shows himself to be fully conversant with the results of very recent research concerning early engineering.

The second section of this volume is particularly after the author's own heart for it covers a period in which Germans were ahead of the whole world in technical achievement. His chapters on Georgius Agricola and Otto von Guericke are as fine brief summaries of the work of these two outstanding men as we have yet seen. Any treatment of the great modern engineers obviously must result in considerable difficulty as to selection, but few would question the legitimate inclusion of any who are covered in this book. On the other hand there are one or two surprising omissions such as the two Brunels. A few misprints have crept in, such as the statement on page 188 that George Stephenson was buried "in the cemetery in Chester"—possibly the result of Chesterfield having been rendered in German and retranslated into English. The volume includes both an adequate index and an excellent list of sources of information, mainly, but by no means entirely German. "Great Engineers" is addressed to lovers of technical achievement and they should welcome it.

Holidays in Britain.—We have received from Thos. Cook & Son Ltd., Berkeley Street, London, W.1, an illustrated guide to the company's arrangements for summer holidays in the British Isles. In the case of several resorts this year, all-in rates are quoted including rail fare to and from London, accommodation (with a choice of four standards) and excursions. For those who favour the now popular holiday camp type of accommodation and amusement, attention is drawn to the facilities at Prestatyn, North Wales, where a camp in a 55-acre garden estate has been established by the joint enterprise of Cooks and the London Midland & Scottish Railway.

Open-Air London. An illustrated Guide to Some 480 Open Spaces in and Around London, Including the Green Belt. Issued by the London County Council and the London Passenger Transport Board. 7¼ in. × 4⅜ in. 145 pp. Paper covers. Price 1s. net.—Paris may have its Bois de Boulogne, and Berlin its Tiergarten, but London claims pride of place as the garden metropolis with that glorious expanse of greenery stretching from Kensington Palace to the Horse Guards and including Kensington Gardens, and the Hyde, Green, and St. James's Parks. Not only in the centre but in the most congested areas as well, *rus in urbe* has been the motto of the authorities. Victoria Park and Clapham Common—to take two examples at random—are well known to Londoners, and, indeed, to most visitors, but not so many people know about the other parks and open spaces in Greater London. It is for such people that the present book has been published. There are many illustrations to supplement a very readable text. Sixty pages are devoted to the open spaces which make up the Green Belt, perhaps London County Council's greatest legacy to Londoners. By December, 1938, the council had approved schemes for the preservation of over 110 square miles of beautiful country. In the introduction to the book, the chairman of the L.C.C. reveals this and other interesting facts and figures about the Green Belt.

A.R.P. Fan Units.—Keith Blackman Limited has brought out a folder describing the firm's fans for ventilating air raid shelters. The maker emphasises that the knowledge that an abundant supply of fresh air is assured them will help to relieve the strain on the nerves of those occupying a shelter during an air raid. Fans are supplied in various sizes to suit all types of shelters. Filters to exclude dust and gas from the shelter can be fixed to them, and they can be worked by hand should the electric supply fail or be cut off.

THE SCRAP HEAP

Proposed "Metropolitan Super-Way" of 1854

During 1854 a Select Committee of the House of Commons sat to inquire into the state and condition of the bridges over the Thames within the area subject to the coal tax. Among many interesting schemes discussed, the taking of evidence provided an opportunity for a Mr. John Pym to put forward a scheme of his own for what was in effect an elevated railway constructed on the lines of Robert Stephenson's Britannia bridge, and we are indebted to Mr. F. W. Fossey for lending us a copy of an extract of the report of this Select Committee, which on July 14, 1854, was ordered by the House of Commons to be printed.

In his evidence on May 23, 1854, Mr. Pym explained that his plan had been submitted in 1851 to Mr. Chaplin and the directors of the London & South Western Railway for the conveyance of their passengers from Waterloo station to Cannon Street but "for reasons never stated it was not entertained." Mr. Pym remarked that the street traffic of the Metropolis having outgrown the width and number of the thoroughfares, he had designed this scheme so as to relieve the city and its immediate environs of the obstructions to which they were subject and to prevent their recurrence in future.

In essence his scheme, which he named the "Metropolitan Super-Way," was for a tubular way similar to the Britannia Bridge on the Chester & Holyhead line, carried on columns of masonry as shown in the accompanying illustration, which is reproduced from Fig. 2 of the printed description. The suggested routes were as follow:—

From the South Eastern Railway station at London Bridge across the Thames to the stations of the Blackwall and Eastern Counties Railways;

A line westward from the Blackwall station to St. Paul's and on to Charing Cross (then, of course, without a station);

A line westward from Bishopsgate Street, near the Eastern Counties station (Shoreditch), to Holborn Bridge and along Holborn to Tottenham Court Road;

A line running westward from London Bridge station to Waterloo station and on to Westminster;

One or more additional cross lines to unite the main east and west lines at several points, such as between Blackfriars and Waterloo Bridges to Holborn, and between Westminster, Charing Cross, and Tottenham Court Road.

Branch lines were also projected to the Elephant & Castle, to Whitechapel Church, to Shoreditch Church, to the Angel, Islington, to King's Cross, to Euston Square station, to Lambeth, and "to such other points in the principal thoroughfares as may be found desirable."

Incidentally the plan which accompanied the printed evidence also indicated a proposed line from Gower Street (where it would have joined the Euston branch) to connect with the Great Western Railway at Paddington.

The masonry columns to carry this tubular way were intended to be sufficiently high to pass over the tops of the houses "without injury to the property beneath." The tube itself was designed to be wide enough for a double line of railway along which trains of light construction would be "propelled by a stationary engine or magnetic power." Moreover, in order to save passengers the inconvenience of ascending to and descending from the Super-Way, it was arranged that they should be "raised or lowered in chambers by the aid of machinery." The length of the tubes, from column to column, was intended to vary between 200 ft. and 300 ft., making about 20 columns to the mile.

The intention of the promoter was that a five minutes' service should be maintained from 6 in the morning until 10 at night, and that there should be first and second class carriages with universal fares of 3d. and 1d. respectively "for all distances."

The reprint from which we are quoting contains a statement that "arrangements are in progress for carrying out Mr. Pym's Plan of a Super-way for the Metropolis, by means of a public Company. Parties who may take an interest therein, and be disposed to co-operate with the Provisional Committee, are respectfully invited to call on Mr. Pym at the temporary Offices of the Committee, 50, King William Street (Office of the Timber Preserving Company), where the original Plans, as submitted to the Committee of the House of Commons, may be inspected."

* * *

MISTAKES BY TWO—BLAME FOR ONE?

An odd case of forgetfulness by two parties to a booking transaction has been brought to our notice. A clerk issued an intending passenger by a Continental boat train with two seat reservation tickets, but unfortunately failed to fill in the carriage or compartment numbers. Extraordinarily enough, the inevitable letter of complaint which arrived in due course was also deficient, lacking both signature and address. Probably the railway company will now be blamed for failing to send the refund requested.

General arrangement of John Pym's proposed "Metropolitan Super-Way" of 1854, reproduced from Fig. 2 of his brochure

OVERSEAS RAILWAY AFFAIRS

(From our special correspondents)

ARGENTINA

The Railway Telegraph Services : Supreme Court's Decision

A decision just made by the Supreme Court in regard to the constitutional validity of the Decree prohibiting the operation of the railway telegraphs as a public service in districts where there are Government telegraph offices, would seem to have finally shattered the hopes of the railways that this vexatious enactment would be repealed. The Decree in question, which was passed some four years ago, evoked strong protests from the railways on the grounds that it violated the terms of their telegraph concessions and was consequently unconstitutional. Also, it has been a source of serious inconvenience to the commercial community and the public generally, as at many important centres the resources of the Government telegraph services are totally inadequate to handle the volume of business offering, for which reason many people found it necessary to use the facilities offered by the railway telegraph offices.

Appeals to Various Courts

As the Government refused to reconsider its decision, the railways decided to appeal to the courts for the repeal of the Decree, and at the same time claimed compensation for the losses which they had thereby sustained, the first companies to take this step being the B.A.G.S. and Rosario-Puerto Belgrano Railways. The Courts of First and Second Instance rejected the companies' case on the grounds that the Government was within its rights in intervening in the public interest, given the nature of the services in question, and that the terms of the concessions did not provide for indemnisation in the event of the services being prohibited from operating. The appeal was then taken to the Supreme Court which upheld the decision of the lower tribunals on all the points raised, except in regard to the Bahia Blanca-Neuquen line of the B.A.G.S.R., the telegraph concession for which, the Supreme Court ruled, could not be withdrawn without a law to that effect being passed by Congress, and payment to the railway company of the corresponding compensation. This concession, however, is too limited in its scope and application to affect the main issue on which the railway companies' contention is based.

Heavy Decrease in Maize Sowings

The splendid wheat crop amounting to 8,700,000 tons, which Argentina harvested this year, seems likely to be offset by a poor maize crop, the second official report issued by the Ministry of Agriculture estimating that 30 per cent. of the total area sown for 1938-39 has been a total loss. The major portion of the area so classified is in the Province of Córdoba, and to a lesser extent in the West of the Province of Buenos Aires and the territory of the Pampa, and in the central and northern zones of the Province of Santa Fé, where practically the whole of the first crop was lost owing to drought. The total area sown throughout the country is estimated at 5,300,000 hectares (13,250,000 acres), a decrease of 899,100 hectares (2,247,750 acres), or 14·5 per cent. below that of the previous year.

Record Cotton Crop

The first forecast issued by the Ministry of Agriculture estimates this year's cotton crop at the record figure of 84,000 tons, an increase of 32,555 tons, or 53 per cent., over that of last year, and the highest so far registered, as will be seen from the comparative figures for the last six years given below :—

	Tons
1933–1934	43,357
1934–1935	64,038
1935–1936	80,957
1936–1937	31,170
1937–1938	51,445
1938–1939	84,000

International Petroleum Traffic

A Decree signed jointly by the Ministers of Foreign Affairs, Agriculture, and Public Works, issued on March 17, authorises the National Oilfields (Yacimientos Petroliferos Fiscales) and the Argentine State Railways to carry out the terms of the agreement of 1937 with Bolivia regarding petroleum traffic between the two countries. The preamble to the Decree states that, although Congress has not yet given its decision on the matter, there are no constitutional reasons why the Argentine Government should not authorise the traffic, either direct or in transit, of Bolivian petroleum through Argentina.

Stone-ballasting of State Railways

The State Railways administration has been authorised by the Government to carry out the work of stone ballasting the line bteween Tucumán and Rosario de la Frontera in the Province of Salta, a distance of some 88 miles. The cost of the work, which is to be spread over two years, is estimated at $700,000 paper.

BOLIVIA

Railway Connections with Argentina

Mr. W. H. Pickwoad, General Manager of the Antofagasta (Chili) & Bolivia Railway, has been on a visit to Buenos Aires to discuss with the Minister of Foreign Affairs, Dr. Luís Maria Cantillo, and the General Manager of the Argentine State Railways, Señor Pablo Nogués, proposals for improving the railway services between Argentina and Bolivia over the route of the Córdoba Central Railway, now incorporated in the State system. Mr. Pickwoad stated that it was the policy of the Bolivian Government to do everything possible to encourage tourist traffic to that country, and a fine new hotel was now being constructed in La Paz for this purpose. The Argentine Government was also doing everything in its power to develop traffic to Bolivia, and in view of the expected increase in trade between the two republics, there was a strong possibility that the international Panamericano train service would be augmented and improved.

CHILE

Repairs to State Railways

Advices from Santiago indicate that the State Railways have been authorised to set apart the sum of 40,000,000 pesos to be expended on the reconstruction of the track, bridges and installations of the Southern zone, which were destroyed by the earthquake in January last. It is, however, stated that this sum is insufficient and that at least 55,000,000 pesos will be required to carry out the work.

UNITED STATES

Hopes of Legislation Dim

In the hearings which are being held by the House Committee on Interstate and Foreign Commerce in Washington on proposed legislation, the road hauliers and the water transport companies have given testimony of their belief that the railways stand in need of relief, but they do not recognise that any part of the railways' difficulties arises from undue political favouritism to their rivals, and they are not willing to make any concessions.

One of the difficulties which hampers the solution of such important public questions in the States is the great distances of the country, and the huge number of persons whose wishes must be considered in reaching a decision. It is difficult to bring people together for purposes of conference, and hence the process of education which must precede definitive action is long and slow.

Why Trains Are Abandoned

The handicaps of the American railways in meeting road competition on lines of light traffic are vividly brought out in a recent report of the Interstate Commerce Commission on a proposal of the Chicago, Rock Island & Pacific Railway to abandon passenger service by rail between St. Joseph and Topeka, a distance of 113 miles, and to substitute therefor a bus provided with a compartment to accommodate mails and parcels traffic. Agreements with the unions require the employment of three men on the railcar which now provides this service in one round-trip daily. For this service, the pay of the motorman is £3 1s. 8d., that of the conductor £2 3s. 1d. and that of the brakeman £1 10s. 11d. On a bus, how-

ever, one driver can probably do all the work done by the three employees on the railcar, and at a daily wage probably not much different from that of the brakeman only.

The unions usually protest against such substitutions of road for rail service when proposed by the railway companies, but, if the railways themselves do not provide substitute services, the alternative is to shut down the railway-worked service altogether. Thus a constant diminution of employment is going on, the direct cause of which is the policy of the unions.

SOUTH AFRICA

Assistance for Union Farmers

Under the Central Government's scheme for assisting farmers, mentioned by the Minister of Finance in his budget speech, an amount of £1,200,000 will be applied to the reduction of road and rail transport and harbour charges. Of this amount the Central Government will contribute £800,000 and the railway administration £400,000. The rebates, which have operated from March 20, take the following forms:—

(1) Rebates of railage charges in respect of goods traffic (including, except where otherwise provided, cartage and private sidings charges, but excluding other miscellaneous charges); (2) rebates of railage and/or grain elevator charges; (3) rebates of pre-cooling charges and handling and shipping charges at the harbours; and (4) rebates of charges on road motor and transport services.

Farmers or consumers who find that they are not receiving the entire benefit of any of the rebates are requested to report the matter to the Department of Agriculture.

FEDERATED MALAY STATES

Revenue and Festival Traffic during February

Railway revenue from all sources for the month of February, 1939, was £128,214, compared with £147,812 for the corresponding month of 1938. The revenue for January, 1939, was £148,008.

Two important events occurred during the month of February, namely, the Tamil (Hindu) festival of Thaipusam on February 2, and the Chinese New Year on February 19 and 20. The former was celebrated by pilgrims throughout Malaya who make their annual pilgrimage to their deity in one of the temples at Penang, Sungei Patani (Kedah), Taiping (Perak), The Caves of Ipoh (Perak), Batu Caves (8 miles from Kuala Lumpur), or Singapore.

Chinese New Year, for which the local Government grants two days' public holidays, was celebrated with rather less enthusiasm than in previous years, due to the unhappy state of affairs in China, coupled with the reduced spending power as a result of the considerable reduction in the export of tin and rubber, the principal commodities of the country.

The Railway Department granted reduced travel concessions of a single fare for the double journey on both these occasions, namely:—

First class	3½ cents	(0·88d.)	a mile.
Second ,,	1½ ,,	(0·42d.)	,,
Third ,,	1 ,,	(0·28d.)	,,

It was necessary to provide several special trains to cope with the traffic.

NEW SOUTH WALES

Financial Results for Quarter Ended December 31, 1938

It is estimated that the loss of net revenue on account of the coal-strike was over £350,000. Consequently, though the number of passengers carried during the quarter under review increased by all but a million, and train-mileage decreased by 188,684, there was a decrease in earnings of £236,860, and expenditure rose by £226,665 as compared with the corresponding quarter in 1937. Coaching earnings, however, increased by £22,364 as against the net drop in goods earnings of £290,272; tonnage fell by 581,635 tons.

SPAIN

Train Services Resumed

After the entry of the Nationalist forces into Madrid on March 28, railway services were promptly re-established. On April 1 the first train entered the Southern station in Madrid from Zaragoza, conveying 70 wagons of foodstuffs. On the same day trains entered the Northern and Delicias stations, and regular services began to operate between Barcelona and San Sebastian and Bilbao, and Valencia and Castellon. It is expected that normal operation on all lines is now a matter of only a short time. In clearing the Seville line, which is expected to be reopened immediately, 24 wagons loaded with explosives were found in the tunnel at Andujar, which had been used as a magazine.

[We referred to the general resumption of rail traffic in an editorial note on page 602 of our April 14 issue.—ED. *R.G.*]

Normal Rail Services

The railway between Madrid and Seville was opened to traffic on April 4, and the departure of the first train in the direction of Madrid was made the occasion of an enthusiastic send-off. The engine was adorned with a large portrait of General Franco, framed in laurels, and this, the first passenger train to run through to Madrid in over two years, was hailed with loud applause from the people congregated on the platforms of all the stations. With the reopening of the Seville line, train services are now completely normal throughout the country. Twenty-five trains of coal reached the capital from Asturias on April 11, and daily rapid services of fish and meat have been re-established. A commission is now considering the fixing of the international service between France and Spain, and the arrangements will be announced almost immediately.

The military authorities have handed over to the companies their respective systems, and working will be continued under the rules and legislation in force prior to the war.

The next phase must be the complete rehabilitation of track and equipment, and preparation for the necessary repairs and renewals, upon which work has already begun. A cursory inspection reveals that there are some 3,000 wagons out of service, and the sheds at Alcazar San Juan are crowded with disabled engines. Among other curious finds is the treasure of the cathedral of Siquenza, discovered on a siding in Madrid.

INDIA

Judicial Tribunal on E.I.R. Accidents

The judicial inquiry into the causes of recent accidents on the East Indian Railway is being conducted by a tribunal, appointed by the Government of India, under the presidency of Mr. Justice Broomfield, of the Bombay High Court. The members are Dewan Bahadur M. K. Velodi, Collector of South Kanara (Madras), and Khan Bahadur Sheik Din Mahomed, Sessions Judge, Punjab, with two assessors, Mr. R. Lean, Chief Mechanical Engineer, Madras & Southern Mahratta Railway, and Mr. A. Sims, Deputy General Manager, North Western Railway.

At a preliminary session in Calcutta on March 20, the President decided that the inquiry should not only be open to the public, but also its sessions should be advertised in the Bengal, U.P., and Bihar press. The reports of the Senior Government Inspector were circulated among members and to a representative of the Bihar Government. It was decided that after digesting the reports the tribunal should reassemble on March 24.

Extension of Narrow Gauge into Bostan

The North Western Railway is arranging to lay a 2 ft. 6 in. gauge line, interlaced with the existing 5 ft. 6 in. gauge track, between Khanai and Bostan junction, near Quetta, in extension of the Khanai—Fort Sandeman narrow gauge line. At present there is a daily broad gauge passenger service from Quetta to Khanai in order to give connection with the narrow gauge trains to Fort Sandeman. By extending the narrow gauge track into Bostan, it will be possible to eliminate this broad gauge service, as the narrow-gauge trains will then connect with the more frequent Quetta—Chaman trains at Bostan.

XUM

LOCOMOTIVE POWER AND EFFICIENCY

A review of maximum locomotive performance which indicates close agreement of results deduced from widely varying foundations

By LORD MONKSWELL

MANY elaborate experiments have been made to ascertain the resistance to traction of all the various kinds of railway vehicles, and the standard of construction and maintenance of most main lines, at least, is now sufficiently uniform to make unlikely, in ordinary circumstances, any very large difference in the effort required to keep each different kind of vehicle moving at uniform speeds. The fact, moreover, that the resistances due to gravity and acceleration are exactly calculable reduces, proportionately to the whole resistance, any inaccuracy there may be in the calculation of the resistance due to variable causes.

The whole subject of locomotive and train resistance is, nevertheless, wrapped in mystery, and it is common to find irreconcilable statements coming from quarters of the highest eminence.

No one who has travelled a great deal on locomotives can fail to be aware that from time to time the resistance varies in a surprising manner. Occasionally, often for no obvious reason, it is either much higher or much lower than might be expected. This does not appear to happen frequently and it is quite insufficient to explain the discrepancies just referred to. In at least nine cases out of ten resistance should be sufficiently uniform to make reasonably dependable the results based upon the latest relevant formulæ.

The results of a large number of experiments are available to choose from. They vary to some extent and there is no particular reason for preferring one to another. In these circumstances average results secured from different tests with large engines and heavy, bogie passenger vehicles may be estimated. It will not be far wrong if the resistance of the engine (without tender) is taken to be 32 lb. per ton at 50 m.p.h., rising, slightly faster than the speed, to 48 lb. per ton at 80 m.p.h., and continuing thus at higher speeds. The resistance of the vehicles of the train, including the tender, may be taken to be 8 lb. per ton at 50 m.p.h., rising, again slightly faster than the speed, by about 1 lb. per ton for every increase of 10 m.p.h. in speed.

These values are for non-streamlined engines and passenger vehicles. For streamlined stock resistances must be suitably modified.

Efficiency Measured by Horsepower per ton of Locomotive

The horsepower which an engine can develop per ton of its own weight is probably the best measure of its efficiency. The greatest possible weight of steam must be generated by each pound of fuel consumed, and the greatest possible proportion of thermal units must be extracted from the steam on its passage from boiler to atmosphere, and turned into work.

Engine efficiency goes far beyond mere economy in fuel. If one engine can develop from the same amount of fuel 25 per cent. more power than another engine of the same weight, reductions in expense of many kinds are rendered possible. The number of trains may be reduced with reduced occupation of the line, reduced numbers of trainmen and reduced maintenance costs, or, conversely, speeds may be increased without increasing locomotive costs. It was only at the end of the 19th century that engines were constructed capable of developing for any considerable period so much as 20 horsepower per ton of their own weight. In 1896 the 4-4-0 engines of the "Dunalastair" class, working the accelerated trains that ran for that one summer on the Caledonian Railway, appear to have been able to perform this feat. The 4-4-0 4-cylinder Du Bousquet-de Glehn compounds of the French Nord line, which had begun to appear some years earlier, also frequently did likewise.

Both these types had features which conduced powerfully to their success. The barrel of the Caledonian engines' boiler was a good deal larger than that of previous engines and had very short tubes—only 10 ft. 7 in. long. The blast-pipe was of the vortex type, in which the steam escaped through an annualar opening, into the centre of which a proportion of the furnace gases was conducted. At the present time, when the importance of blast-pipe design is attracting so much attention it seems probable that the great efficiency of the Caledonian engines was much more largely due to these blast-pipes than was suspected at the time. It is to be noted that only the first lot of the "Dunalastairs" (Nos. 721-735) had them. Subsequent lots, whose work never seems to have approached that of the first lot, were, I believe, not fitted with Vortex blast-pipes.

Early Nord 4-cylinder Compounds

The differences of the French 4-cylinder compounds from previous engines are too well known to require comment.

In 1900 the Nord brought out a much enlarged design of 4-cylinder compound with the 4-4-2 wheel-arrangement, which did work greatly in advance of its 4-4-0 predecessors. The late Mr. Charles Rous Marten has left records of a great deal of the work of these engines, observed by him. About the best of many excellent performances was one by engine 2.659 working a train of 310 tons behind the tender up Survilliers bank (12½ miles averaging 1 in 230) from Paris. A constant speed of 62 m.p.h. was maintained the whole way up the bank. This gives horsepower of about 1,650 if the resistance of the vehicles of the train is taken to have been 10 lb. per ton. At the time the performance took place, about 1902, express train vehicles were a good deal smaller than those used in later tests and it is probable that their resistance was at least 10 lb. per ton at 62 m.p.h. Horsepower of 1,650 works out at over 25 per ton-weight of engine.

One of the most interesting of a number of performances of similar engines during the early years of the century was that of engine No. 2.668 with 257 tons behind the tender. At the time this run was made the quadrupling of the Nord main line as far as Survilliers was in progress and some of the kilometre posts had been taken down, with the result that it was impossible to obtain detailed timings before post 11. (Survilliers bank begins between posts 7 and 8.) Post 11 was passed in 8 min. 37 sec. from the start, and, by comparison with timings made on other occasions, speed must have been well over 62 m.p.h. at the bottom of the bank. The remaining 16 km. to post 27, just before the summit, occupied 9 min.

44 sec. (61·4 m.p.h.), so that the whole ascent must have been made no slower than that of No. 2.659, though the speed was not quite so regular. Applying the same figures for resistance, the average horsepower up Survilliers bank works out at 1,500, or 23 h.p. per ton of engine.

These engines were subsequently rebuilt with superheaters, but by that time they had been superseded on the fastest and heaviest trains by bigger machines, and no longer had the same opportunities of doing spectacular work. In 1929, however, No. 2.644, with 300 tons behind the tender, ran up Gannes bank from post 51 to post 86 at an average speed of 65 m.p.h. The vertical ascent is 310 ft., speed was 50 m.p.h. at post 51 where a slack to that speed is required and 62 m.p.h. at the summit, post 86. If the resistance of the vehicles of the train is taken to have been 9 lb. per ton, the total average horsepower for this distance of nearly 22 miles works out at 1,550.

Post-War Nord Compounds

The post-war 4-6-2 engines of the Nord, built with superheaters (Nos. 3.1201-3.1290), are capable of developing higher powers per ton and have many such performances to their credit. One of the best was that of No. 3.1288 on the section of the line just described. With 395 tons behind the tender this engine covered the 35 km. from post 51 in 17 min. 57 sec. (72·6 m.p.h.), speed being 50 m.p.h. at post 51 and 72½ m.p.h. at the summit. Horsepower for the whole distance works out at 2,500. As the engine weighs 99 tons, horsepower per ton was 25.

Another performance was that of engine 3.1289 ascending the bank to Gannes summit from the north. In 33 km. (20½ miles) between posts 120 and 87 the line rises 270 ft. With 414 tons behind the tender this distance occupied 17 min. 2 sec. (72·2 m.p.h.). Speed was 68 m.p.h. at post 120 and 72 m.p.h. at Gannes summit. Later in the same run the 20 km. of Survilliers bank (48-28), where the ascent averages 1 in 220, were run in 11 min. 9 sec. (66·7 m.p.h.), speed rising from 63 m.p.h. at post 48 to 70 m.p.h. at the summit. This gives an average horsepower of 2,600, or 26 per ton.

For short distances the 4-6-2 Nord engines have sometimes developed powers in the region of 2,800 horses. No. 3.1276 with 404 tons behind the tender maintained 71·6 m.p.h. steadily for 4 km. up a gradient of 1 in 200, and No. 3.1282 with 495 tons, running up 1 in 250, covered 4 successive km. in 30 sec. (74·5 m.p.h.), 30⅕ sec., 30⅖ sec., and 30⅕ sec. (72·6 m.p.h.)

Chapelon Rebuilds

The reconstructed Paris-Orleans engines have again increased the horsepower-per-ton effort. Some of the most remarkable performances were carried out with a dynamometer car next the engine, from which very accurate results could be secured. P.-O. engine 3.715, a 4-6-2, with 636 tons behind the tender ascended Survilliers bank from the north at the practically constant speed of 64 m.p.h. The gradient is about 1 in 220 and the horsepower measured at the drawbar of the tender averaged 2,200 for the 8 miles before the summit. The resistance of engine and half-empty tender would absorb about another 1,000 horse-power. Nord engine 3.1176 of the same type, with a train of 559 tons behind the tender, averaged 66 m.p.h. for 9 miles up the same bank till slacked by an adverse signal. In both cases horsepower per ton of engine weight must have been about 32, as these engines weigh about 100 tons. No. 3.1172 with 480 tons behind the tender, on a wild, stormy evening had a bad attack of skidding near post 44. This reduced speed to about 64 m.p.h. The remaining 16 km. to the summit occupied 8 min. 42 sec. (68·6 m.p.h.) and at the summit speed was 70 m.p.h. Horsepower by the formula works out at 3,000. This was a remarkable run, as steam was cut off in all cylinders at 50 per cent. instead of 60 per cent., as in the two preceding instances.

The Paris—Orleans rebuilt 4-6-2 engines of the second type (P.O.-Midi 231.722 to 731 and Est 231.051 to 073) are improvements on the first type. One of them is stated to have developed a maximum of 3,700 metric horsepower (about 3,650 British horsepower). Particulars have been published of a trial run of No. 231.726 with the Sud Express. A dynamometer car was in use and the load behind the tender was 612 tons. While the train was ascending a gradient of 1 in 200 at 73-75 m.p.h. the horsepower measured at the drawbar of the tender several times reached 2,400. At a constant speed the resistance of engine and tender would account for another 1,200 h.p., but neither speed nor gradient was sufficiently uniform to allow the resistance of engine and tender to be closely estimated from the published diagram at any given point. It may, however, be said with confidence that for the 35 km. from post 339 to post 374, between Poitiers and Angoulême, the average horsepower developed was about 3,200 and that this included 5 miles where easy gradients made it necessary to prevent the engine from exerting her full power.

It is easier to calculate the power developed on an ascent of Ste. Maure bank by the same engine, with 617 tons behind the tender. This bank lies between posts 277 and 265 of the P.-O. main line. The ascent averages 1 in 200 and such variations of gradient as there are are insignificant. Speed was 74½ m.p.h. at the foot of the bank, fell to 66 m.p.h. at post 271 and then remained constant to the summit. The vehicles were almost entirely P.-O. stock which are found to have resistance somewhat greater than that of the Wagon-Lits vehicles used in the Sud Express. Comparing this performance with that of P.-O. engine 3.715 up Survilliers bank on the Nord, where the measured horsepower at the tender drawbar was 2,200, it is found that on Ste. Maure bank, speed, after it had become constant, was 2 m.p.h. higher, the gradient was slightly steeper and the vehicles of the train, though not quite so heavy, probably ran wih greater resistance. It is therefore reasonably certain that resistance equal to 2,300 h.p. at the tender drawbar (which is reached by assuming a resistance of 10 lb. per ton) is not an overestimate. The resistance of engine and tender (partly empty) works out at 1,100 h.p. by the formula, but as the engine had received a streamlined covering since the run described with the Sud Express, allowance has to be made for this. Such tests as have so far been made indicate that the streamlining of No. 231.726 may be expected in average conditions to economise about 100 h.p. at 66 m.p.h. So the average horsepower at this constant speed works out at 3,300. The engine weighs (with streamlining) 103½ tons.

Particulars have been published showing that for short distances the 4-8-0 reconstructed engines of the P.-O. have developed slightly over 4,000 horsepower. There has also been published a diagram of the work of one of these engines, No. 4.707, ascending Survilliers bank from the north with a train similar to that worked by the 4-6-2 No. 3.715 (636 tons behind the tender). In these conditions horsepower at the tender drawbar averaged 2,400 for the last 8 miles of the bank, speed being maintained at about 70 m.p.h. The resistance of engine and tender may be estimated at 1,300 horsepower, making a total of 3,700. The engine weighing 108 tons, the sustained effort per ton of engine was about 34 h.p.

With regard to the maximum powers exerted by British locomotives, expressed in terms of horsepower per

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ton-weight of engine, we were told by Sir Nigel Gresley in 1936 that he considered that the effort, estimated by him at between 2,500 and 2,600 horsepower, exerted on Cockburnspath bank by an L.N.E.R. streamlined 4-6-2 engine, weighing 103 tons, was the highest that had been reached up to that time. Since then engines of this type have performed other remarkable feats. In *The Railway Magazine* of September, 1937, figures are given of a performance of engine No. 4489, *Dominion of Canada*, with 325 tons behind the tender. The 15¼ miles from Tallington to Stoke summit, where the average ascent is 1 in 264, were covered in 11 min. 22 sec. (80·8 m.p.h.) and speed fell from 85 m.p.h. to 74 m.p.h. On the basis of the resistances suggested, engine-resistance would be 48 lb. per ton at 80 m.p.h., and train (including tender) resistance about 11 lb. per ton. This works out at about 2,750 horsepower, if no account is taken of the effect of the streamlining of both engine and train. Sir Nigel tells us that the horsepower saved by streamlining this engine is estimated at 100 at 80 m.p.h. If another 50 h.p. are saved by streamlining the train, the total average horsepower exerted comes to very much the same as his estimate of the work on Cockburnspath bank.

No. 4468, *Mallard*, with 240 tons behind the tender, shortly after passing the end of a long stretch of gradient falling at 1 in 200, attained a speed of 125 m.p.h. The gradient varies just before the spot where this speed was reached, but at the foot of the 1 in 200 speed was only slightly less and it is more convenient to consider the conditions here. Again assuming that resistance increased regularly, the resistance of the engine at 125 m.p.h. would be about 75 lb. per ton, and that of the rest of the train, including the tender, about 16 lb. per ton. In these circumstances horsepower amounting to 2,600 would be required to maintain a constant speed, if no allowance were made for streamlining. The horsepower saved by streamlining the engine is estimated by Sir Nigel at about 370. Another 230 may be saved by streamlining the train, say 600 in all. This leaves 2,000 horsepower. Acceleration must also be considered. At the foot of the 1 in 200 the speed is stated to have been rising at the rate of 2 m.p.h. per mile. This would absorb some 800 h.p., making the total horsepower developed about 2,800.

German High-Speed Tests

Attention may here be directed to some high-speed tests made in Germany and described in *Glasers Annalen* of December, 1935.

The engine used was the streamlined 4-6-4 No. 05.002. This engine weighs 128 tons and is followed by a tender (87 tons, full) which, when partly full, may be taken as weighing 72 tons, say 200 tons for the two vehicles together. The tests were made on the Berlin—Hamburg line, where the gradients should be imperceptible at the speeds reached —90 to 122 m.p.h. The weight of the trains behind the tender varied from 193 to 238 tons. The most striking result emerging from these tests is that in almost every case the effort exerted at the tender drawbar was more than half the indicated horsepower. At 102 m.p.h. the power required to keep engine and tender moving at constant speed on a falling gradient of 1 in 2,500 was only 1,000 h.p., while the 238-ton train required 1,600. Assuming that the tender contributed only one-tenth of the resistance of engine and tender together, this works out at a resistance for the engine alone of no more than 27 lb. per ton, and of 25 lb. per ton for the vehicles of the train. From this it would appear that the position of the (streamlined) engine at the head of the train, where it must cleave its way unaided through the atmosphere and must perform most of the work of compressing the road, together with the friction of its motive machinery, do not, all told, cause, at high speeds, so much resistance as is caused by the air resistance of five large bogie passenger coaches (unstreamlined). At 122 m.p.h. the resistance of the engine, on a similar calculation, works out at 35 lb. per ton, and that of the vehicles behind the tender at 24 lb. per ton.

It is stated that these tests and the figures deduced from them are only provisional, and that further tests will be undertaken. Even so it is difficult to reconcile the figures with any that had previously been arrived at. In particular on these figures the streamlining of the engine must have results far more favourable than were generally expected.

It may, however, be pointed out that there is one curious similarity between the performance of the L.N.E.R. engine which reached 125 m.p.h. running down a gradient of 1 in 200, and that of the German engine which reached 122 m.p.h. on the level. If to the 2,000 h.p. calculated as the power required to keep the British train moving at the constant speed of 125 m.p.h. down a gradient of 1 in 200 there be added the assistance provided by gravity, which is equal to about 1,400 h.p., the total effort works out at 3,400 h.p., which is within ten per cent. of 3,100 h.p., the figure given for the horsepower of the German engine working a train of similar gross weight on the level at the constant speed of 122 m.p.h. Part even of this small difference would be accounted for by the slightly lower speed of the German engine and a further part by the larger diameter of the latter's driving wheels—7 ft. 6 in. against 6 ft. 8 in.

It is seldom that results based on such widely different foundations agree so nearly. How it comes about is indeed a puzzle. These matters will in time, no doubt, be thoroughly sifted.

I have to thank the Editors of *Engineering* and of *Discovery* for permission to quote figures published in those journals.

A Remarkable Route Interlocking

On November 27, 1938, the Central Railroad of New Jersey put in service a most interesting power signal installation at Elizabethport, New Jersey, an important junction on its main line which carries a heavy traffic, especially at peak periods. The track layout had been extensively modified after the abolition of a number of level crossings in the city, and, as modification of the existing equipment was impracticable, a new electro-pneumatic plant was decided on. Its outstanding feature is that it is worked on the route-setting principle, the signalman operating push-buttons, placed at the beginning and end of a route marked on a panel diagram apparatus, to set the road for a train and clear the necessary signals. The panel is compact and pleasing in appearance, and the engineering details of the relay and other equipment outside the operating part of the signal box are attractive in design. The track diagram sections are normally dark; a route lights up throughout in white when fully set and changes to red progressively with the train movement. This arrangement has also been adopted in France in recent years. A description of the work appears in *Railway Signaling* for March, 1939.

SAFE SIGNAL CIRCUITS

Growth of use of electrical appliances in signalling has necessitated close attention to circuit design to ensure maximum safety

IT was not long after the electric telegraph became a practical possibility, albeit long limited to simple appliances compared with those met with today, that electricity came to be used to any extent for safeguarding railway traffic. From the outset it was seen that some precautions against false operation by outside influences, such as wrong contact between line wires, mistaken connecting up, lightning, and so on, were essential if electrical appliances were to be depended on. The old-fashioned engineer of those early days, indeed, was often heard to express misgivings about placing too much reliance on electricity. False indications on block instruments, for instance, might have very grave consequences, especially in single-line working. Nevertheless, beyond the observance of one or two simple rules, such as the time-honoured admonition " Always put your battery to earth," and careful maintenance, no very special safety measures were, as a rule, taken. Operating rules were relied upon to such an extent as to make it difficult, at least, for a dangerous failure to pass unobserved by a careful signalman, who was expected not to make use without inquiry of, say, a " line clear " indication when his other information tended to show that message to be incorrect. All who have had practical experience in this field know that there have been many instances where vigilance and common sense have prevented a defect from leading to harm; whatever progress is made in constructing failure-proof apparatus, this must always be a factor.

While needle telegraphs, block equipment, signal repeaters, and a few other valuable adjuncts to mechanical signalling, such as electric point detectors, were practically all the electrical apparatus associated with train signalling, the question of circuit design did not attract much attention. An exception was, perhaps met with in connection with single line instruments, especially for use overseas, where the operating staff might not be too reliable, and might foolishly make use of some release obtained through defective circuit conditions, or even endeavour to resort to trick manipulation of some kind. Ingenious means were contrived for preventing the incorrect working of single line apparatus, the consequences of which could be so disastrous, and a few such means were adopted with success. Precautionary measures were in due course devised to cover the possibility of batteries being wrongly connected up by mistake or by design. Much progress was made, too, in guarding apparatus against lightning effects, a problem encountered at the outset in electric telegraphy, and one responsible for the introduction in early years of the induced needle, probably used more in railway work than any other single invention in the electrical field.

With the introduction of electric power for the operation of points and signals and the growth of track circuit and automatic signal systems, the question of safe circuits became more important for, whereas with manual operation the motive power for moving lineside functions came direct from the operator, in power working it existed independently of him, and could, if certain defects in the equipment arose, be wrongly applied to a function without any action on his part. The possibility, for instance, of points being moved incorrectly from such a cause was so serious, as violating the fundamental principles of all safe working, that it was at once seen that precautions going far beyond what had previously been usual were essential. As the various power systems developed, considerable thought was brought to bear on designing adequate protection against crosses and other circuit faults, and a remarkable number of ideas was put forward on the subject. It is indeed surprising that so many different suggestions should be possible at all, and even now, when the rectifier is a well-established, reliable device, new suggestions are being made.

The great importance of this subject to the signal engineer was emphasised by Mr. F. C. Bruce in his timely paper thereon read before the Institution of Railway Signal Engineers on March 22. He dealt with certain of its fundamental issues, showing how varying degrees of protection could be attained short of perfection, and how a certain balance between reasonable security and complication had generally to be decided on. In signal engineering it is the same as in other branches of railway work. It is possible to imagine schemes containing safeguards against every conceivable contingency or combination of circumstances, but a balanced view of practical considerations does not justify their use. " Vital " circuits, as Mr. Bruce called them—" vulnerable " is another term we have heard employed—do demand very complete protection, but there are others where little is called for. Even in their case, caution is necessary in making a decision, for although mere indicating apparatus may not be " vital," there are circumstances in which confusion can arise from irregular working. Experience shows that hasty and ill-considered action can follow a misunderstanding so produced, and finally lead to an accident on lines equipped with excellent signalling.

Sound Maintenance Essential

The design of signal circuits, which in recent years has assumed an importance at one time little expected, is an example of how compromise, supplemented by good maintenance and careful training of staff, must be made between practical possibility and ideal conditions. For, try as we may to make failure-proof systems and devices, there is no escaping the fact that it is on sound material construction, correct installation, and subsequent care that safety must still greatly rest. While fully acknowledging all that has been done by numerous able workers to eliminate dangerous circuit possibilities, or at least to reveal them in time to avoid harm being done, we see little prospect that conditions can ever be very much different.

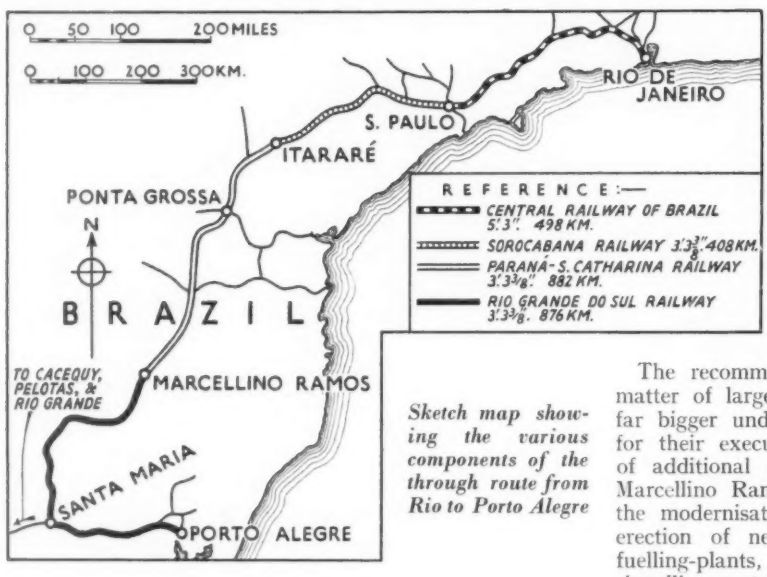
YORKSHIRE VIADUCT RECONSTRUCTION.—The L.M.S.R. announce that work has begun on the reconstruction of Snaygill viaduct, situated between Cononley and Skipton on the Leeds to Skipton line, where it takes the railway over the River Aire. The new structure will consist of two spans, one of 70 ft. over the river, and one of 50 ft. to the south of the river. It is proposed to fill in the existing northern span, and to provide an outlet for flood water by a culvert through the new embankment. Steel main girders and cross girders and concrete decking will form the superstructure, and the existing south abutment is to be extended to accommodate the extra width of the new bridge. With the same object in view, additional concrete piers and sill girders (spanning between the new piers and the old piers), are to be constructed at each side of the river.

XUM

RIO GRANDE DO SUL RAILWAY, BRAZIL

With special reference to its forming an integral part of the through rail route between Rio and Porto Alegre, 1,655 miles in length

THIS railway operates approximately 2,000 miles of metre-gauge line in the southern portion of Brazil, the main system running from Porto Alegre (the capital of the State of Rio Grande) to Marcellino Ramos *via* Santa Maria; from the last-named place another important route diverges to Pelotas and Rio Grande *via* Cacequy, which in its turn is the junction of various subsidiary lines giving access (both direct and through further ramifications) to the Uruguayan and Argentine frontiers. The importance of the Rio Grande do Sul Railway lies in the fact that, by means of its main system, it forms one of the links in the chain of railways connecting the Federal Capital of Brazil (Rio de Janeiro) and the city of São Paulo with Porto Alegre. The remaining links are provided by the Paraná-Santa Catharina Railway (Marcellino Ramos to Itararé); Sorocabana Railway (Itararé to São Paulo); and Central of Brazil Railway (São Paulo to Rio).



Sketch map showing the various components of the through route from Rio to Porto Alegre

Prior to March, 1938, the total distance by rail between Rio and Porto Alegre was 2,711 km., and the time occupied by the best through service (including waits at railway "frontier" points and station stops) was 107 hr. 12 min. Subsequent acceleration of trains on the Rio Grande do Sul Railway and the opening of two new direct lines on its main system enabled the distance to be reduced to 2,664 km. and the time to 95 hr. 23 min. The latter gives an average of 26 km.p.h. including all halts, and, on the basis of actual running time, one of 36 km.p.h.

Officials of the Rio Grande do Sul Railway have recently been going closely into the question of improving still further the throughout journey time between these two cities, and, with this in view, have made the following recommendations for discussion at the Second Congress of Railway Engineering and Legislation [referred to in the Overseas columns of THE RAILWAY GAZETTE of February 17 last]:—

(1) That a timetable conference be held immediately between the administrations of the four railways concerned.

(2) That the new Fiat railcars, ordered by the Central Railway, be put into service and worked at suitable times between Rio and São Paulo.

(3) That restaurant cars be introduced on the Ponta Grossa—Marcellino Ramos section of the Paraná—Santa Catharina Railway.

(4) That station time allowances be curtailed, especially on the Paraná—Santa Catharina and Rio Grande do Sul Railways.

(5) That the capacity of locomotive tenders be increased, so as to avoid a multiplicity of water stops.

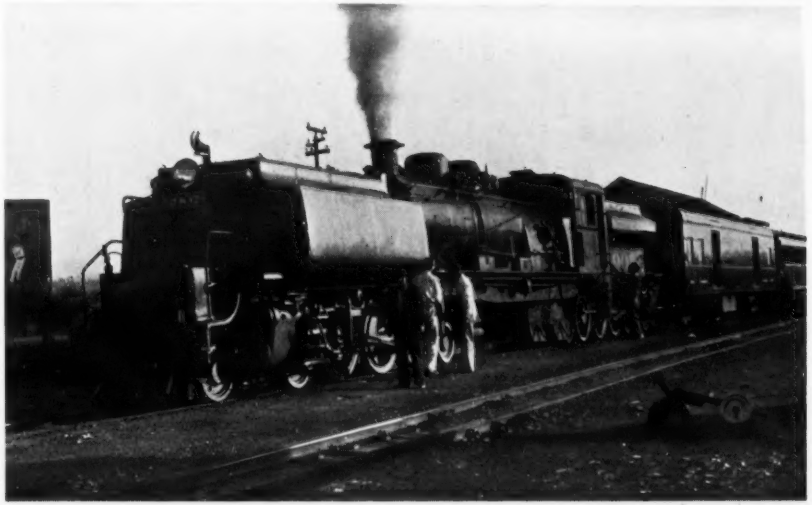
It has been calculated that the adoption of (2) would save 2 hr. 43 min. in running time from Rio to São Paulo, and 6 hr. in the change over from the Central to the Sorocabana Railway at the latter point, if the railcar left Rio in the morning. The adoption of (3) would economise a further 1 hr. 32 min., by eliminating lengthy meal time halts, and thus, quite apart from any saving that might be effected at stations and at watering and re-fuelling points, the overall journey time could easily be reduced to 85 hr. 8 min., and the average speeds, including and excluding stops, raised to 31·3 km.p.h. and 40·8 km.p.h. respectively.

The recommenders realised, however, that the whole matter of large-scale acceleration on this route involves far bigger undertakings, all of which would need time for their execution. Among these are the construction of additional direct lines, especially on the Itararé—Marcellino Ramos section, the strengthening of bridges, the modernisation of locomotives and rolling-stock, the erection of new water-columns and mechanisation of fuelling-plants, the introduction of up-to-date and efficient signalling systems, and the extension of stone ballasting. Nevertheless, the suggestions, if implemented, would effect a considerable saving in time, and benefit those passengers who—not wedded to air-travel by inclination or compelled by the urgency of their business to use it—like to enjoy the interesting and varied scenery of Brazil from a seat in the train, but without undue delay *en route*.

On the opposite page are illustrations of trains and locomotives on the Rio Grande do Sul Railway. No. 1 shows a 32-seat railcar built in the railway shops; No. 2 a Garratt from Germany working one of the night trains on the main line; No. 3 a Canadian 2-8-2 locomotive (the best type, it is said, for burning national coal); and No. 4 an old Belgian 4-4-0, which dates back to the days when the railway, before its acquisition by the Federal Government, was owned by a Belgian company operating in Brazil under the name of Compagnie Auxiliaire.

RAILWAY EXHIBITION AT MEXBOROUGH.—An exhibition of the latest L.N.E.R. rolling stock is to be held at Mexborough goods yard on Saturday and Sunday next, in aid of the Montagu Hospital, Mexborough. Exhibits will include a streamlined Pacific of the type used to haul the Coronation express, signal and telegraph demonstration van, an electric kitchen car, sleeping cars, breakdown crane, camping coach, horse box, and other types of railway vehicles. On the Sunday the signal box will be open for inspection.

Petrol railcar built by the railway company to hold 32 passengers



German-built 4-6-2 + 2-6-4 Garratt locomotive on night train for Santa Maria

Canadian-built 2-8-2 locomotive on express

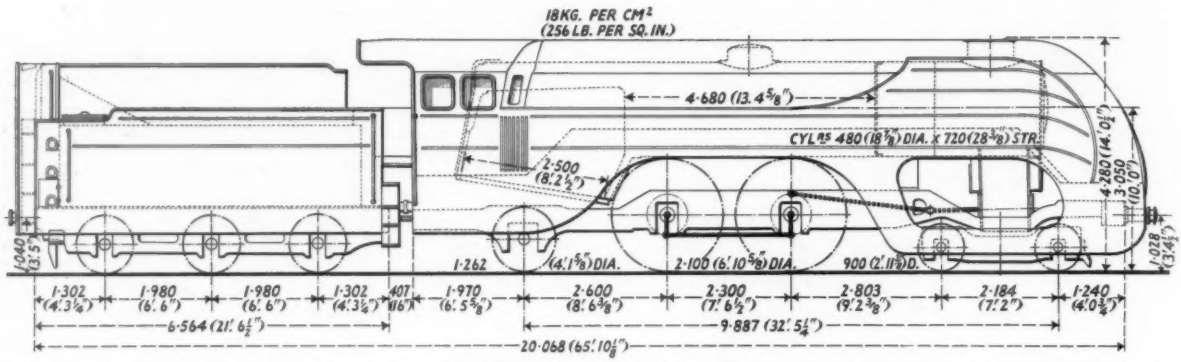
Old Belgian-built 4-4-0 locomotive

SCENES ON THE RIO GRANDE DO SUL RAILWAY OF BRAZIL

NEW BELGIAN HIGH-SPEED LOCOMOTIVES

Inside-cylinder Atlantic type for the Ostend-Brussels one-hour trains to be introduced on May 15

FROM the introduction of the summer timetables on May 15 the Belgian National Railways will run new *rapides* from Brussels Midi to Ostend Quay at 8.50 a.m. and 5.50 p.m., and from Ostend to Brussels at the same departure times. The schedule, constituting a new steam record as observed on page 637, allows one hour for the 70·8 miles in each direction, inclusive of a stop at Bruges; from Brussels to Bruges, 57·7 miles, the booking will be 46 min. (75·3 m.p.h.), and from Bruges to Ostend, 13·1 miles, 13 min. (60·5 m.p.h.); in the reverse direction the trains will run from Ostend to Bruges in 12 min. (65·5 m.p.h.), and from there to Brussels in 47 min. (73·7 m.p.h.). Each set train will seat 12 first and 100 second class passengers and weigh empty 163 tons.



Dimensions of new inside-cylinder Atlantic locomotives built for hauling Ostend-Brussels high-speed trains of Belgian National Railways

New Atlantic locomotives of the type shown in our diagram will be used in the service. These engines, at present under construction at the John Cockerill works, Seraing, have inside single-expansion cylinders driving the crank-axle of the leading coupled wheels. The boiler carries a working pressure of 256 lb. per sq. in., and the adhesion weight approximates to 22·5 tons per coupled axle. Ample grate area and firebox dimensions, as well as large and direct steam passages, are noteworthy features of the design. Kylchap double blastpipe and chimney are fitted. Sustained high-speed running is indispensable in operating a service of this kind, and the numerous Pacific engines of the Belgian National Railways, although capable of continuous fast running with heavy trains, were deemed unsuitable on grounds of economy for handling light three-coach trains at start-to-stop averages up to 75 m.p.h. The tenders are of relatively small proportions and of the six-wheeled type, it being unnecessary to carry large supplies of water and coal for the comparatively short distance involved.

The principal dimensions of the locomotives are:—

Cylinders (2), dia.	18⅞ in.	
,, stroke	28⅜ in.	
Coupled wheels, dia.	6 ft. 10⅝ in.	
Leading bogie, dia.	2 ft. 11⅜ in.	
Trailing wheels, dia.	4 ft. 1⅝ in.	
Boiler, length between tube plates	13 ft. 4⅜ in.	
,, height of centre from rail	10 ft. 0 in.	
Evaporating heating surface, boiler tubes	1,528·5	sq. ft.
,, ,, ,, arch tubes	21·5	,,
,, ,, ,, firebox	177·8	,,
,, ,, ,, total	1,727·8	,,
Superheating surface	678·0	,,
Combined total	2,405·8	,,
Firegrate area	40·0	,,
Boiler pressure, per sq. in.	256	lb.

The engine in working order weighs 86½ tons, of which 45¼ tons rank for adhesion, and develops a tractive effort of 23,502 lb. They are designated Class "12." Two of the engines built to this design are to be fitted with Caprotti and two with Dabeg poppet valve mechanism.

Welding Locomotive Frames

One of the most prevalent troubles with present-day locomotive plate frames is the slackening of bolts and rivets. The strength and security of bolts and riveted joints is based on the assumption that every bolt and every rivet will remain perfectly tight, but under the severe conditions of locomotive service this assumption does not hold good, and welded designs score heavily by removing this cause for repairs and time out of service. Not only is the efficiency of the frame increased, but the more rigid welded structure better serves its purpose as a bed-plate for the engine driving mechanism, with the result that the life of bearings is increased and there is a considerable reduction in the cost of repairs, with extended locomotive availability. Mr. Frederick Mills, of the Western Australian Government Railways, writing in our contemporary, the *Commonwealth Engineer*, on the subject of welded locomotive frames, remarks that the advantage of reduced cost of construction is very real not only in its direct effect but on account of its indirect influence on the cost of transport. In a particular case, namely that of a 4-8-2 type locomotive, the reduction in weight, using a welded frame, amounted to 4 per cent. of the total weight of the locomotive, and this saving can well be applied to increase the capacity of the engine, giving greater haulage propensity and improved efficiency.

THE OPERATION OF MOTOR GANG TROLLEYS

Some notes on the methods adopted on the Entre Rios and Argentine North Eastern Railways

By ROGER F. WILLIAMS,
Chief Engineer, Entre Rios and Argentine North Eastern Railways

DURING recent years many railways in different parts of the world have furnished their permanent way gangs with motor driven trolleys and two trailers for the conveyance to and from work of the men, their tools, and materials. It is universally claimed that this practice has proved highly economical and the benefits derived numerous and far reaching. The practice has revolutionised track maintenance methods by making possible the formation of larger and more efficient gangs, covering much longer sections than previously. The men are saved the heavy effort of transporting themselves to the point of work by hand-operated pump trolleys or by other means, and begin the day's work without the initial fatigue inevitable with the old system; in conditions of stress (floods, major accidents, and similar circumstances), gangs can be concentrated from quite long distances in a surprisingly short space of time. The new system, where it has been well organised, has proved a great success.

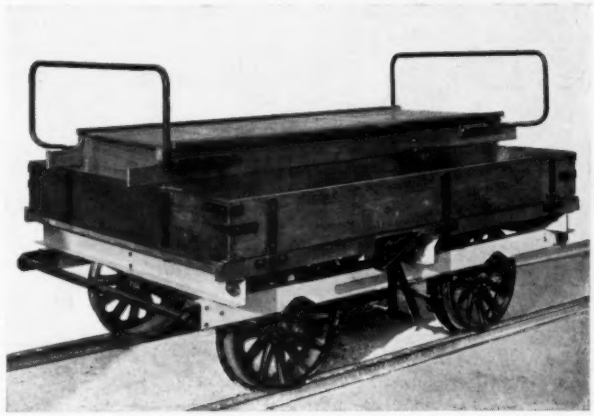
The foregoing is the conclusion arrived at by the writer after over four years' experience of motorised gangs on the Entre Rios and Argentine North Eastern Railways, which systems, over a combined length of 2,254 km. of main line, employ 72 such units, and it is interesting to analyse some of the many causes that have contributed to the success achieved. The units employed on the railways mentioned are made by D. Wickham & Co. Ltd. of Ware, and the latest are fitted with a twin-cylinder J.A.P. (1,300 cc.) engine. Full share of credit must be given to the designers and manufacturers of these British built units; the sound design and the simple though rugged construction have enabled them to stand up to the exacting conditions with surprising freedom from mechanical breakdown.

Another factor that has contributed greatly to the success of this new system is the manner in which the gangers—even the old timers—have adapted themselves to new conditions; most of them are natives, semi-illiterate and unacquainted with any machine more complicated than their old pump trolleys, yet practically all of them have been successful in passing a Government examination and test. This came as an agreeable surprise to those responsible for implanting the new system, and, moreover, the freedom from breakdown is a matter on which both the makers and the drivers can be justly proud. A system has been adopted on both the railways named whereby every six months three cash prizes are given to the gangers who score most points; the maximum possible is 100 points, and these are distributed as follow:—

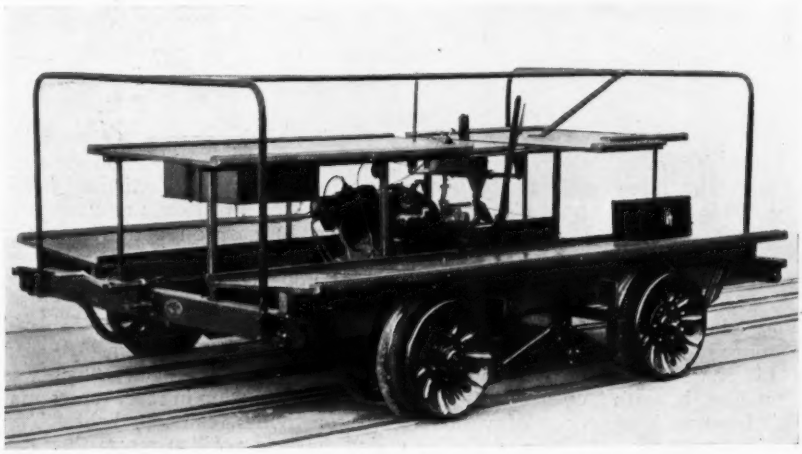
	Points
Freedom from accident	50
Freedom from breakdown	20
Petrol and oil consumption	20
General appearance and cleanliness	10

This has given excellent results, and the men take great interest in their units and pride themselves on the smart appearance maintained. At the beginning of every six months, every ganger is credited with his 50 points for "freedom from accident," and he forfeits them all if his unit suffers one accident which it is proved that he could have avoided. The question of "safety first" is constantly being brought before them and very severe steps are taken in cases of carelessness or failure to observe the regulations.

Systematic maintenance has been a generous contributor to success, and anyone contemplating the adoption of motorised gangs who fails to give full consideration to this is not going to make a success of his venture. On the railways named above each unit is brought into a specially equipped



Trailer used with motor gang trolley



Motor gang trolley as used for permanent way work on the Entre Rios and Argentine N.E. Railways

shop on completion of 15,000 km. since the last overhaul (this being the kilometrage run in from 18 to 21 months); the trolley is stripped completely and every part thoroughly cleaned and examined, and defects are made good or parts replaced. Whilst undergoing a general overhaul the unit is repainted, and the practice here is to repaint with a different colour at each general overhaul. The new units are received from the makers painted a bright green; when undergoing the first general overhaul they are painted signal red, and on the second overhaul canary yellow. This simple system has been of great utility to the inspectors and engineers, as at a glance it can be seen that the trolley has been overhauled within 21 months and during that short time has received proper attention.

Running repairs are carried out by motor inspectors, who inspect the units thoroughly and make minor adjustments once a month. These inspectors have travelling living wagons partly fitted up as a workshop and they carry a spare trolley which they loan to the ganger whilst repairing his unit. These repairs include decarbonising and fitting new piston rings. Three inspectors are employed, each having his own section. Where gradients are heavy, cuttings deep, and visibility poor, the gangers are supplied with portable telephones by which enquiries are made before returning to headquarters as to the running of trains on their respective sections; on the rest of the system the trolleys are run like pump-trolleys, without clear line.

IMPROVEMENTS AT LIVERPOOL STREET IN 1938

Renovations, and removal of obstructions from circulating areas at this busy L.N.E.R. terminus

LIVERPOOL STREET station, L.N.E.R., has long been the bogey of the cleaners and renovators. Steam locomotive movements take place under its roof almost the clock round, and, in addition to the soot which gradually accumulates as a result, fog and—in windy weather—dust add their quota of grime. In 1937 a comprehensive scheme was evolved by the L.N.E.R. for brightening and overhauling many of its more important stations, but the depression due to the strained international situation last year made it necessary severely to curtail the programme. By the end of 1938, however, many improvements had been carried out at Liverpool Street, and have recently been described in the *L.N.E.R. Magazine*.

West side suburban booking office, with new Vitriolite facing and plate-glass windows

The interior masonry and steelwork have been cleaned and painted, and the main approach on the west side brightened. Changes in the main-line booking hall include the installation of up-to-date lighting, the enlargement of the accommodation, and a general redecoration and making more comfortable. The west side suburban booking office has now a front faced with Vitriolite and plate-glass ticket windows in stainless steel frames. Opposite this office the wall has been opened out to allow of easier interchange with the new subway to the Central Line of the L.P.T.B. The east side booking office, recently mechanised, has had its walls panelled with Vitriolite. An illuminated canopy now appears over the Bishopsgate Street entrance. New telephone call-boxes have been provided on east and west sides of the station, postal letter-boxes centralised, and new automatic machines grouped together.

One of the greatest improvements at Liverpool Street has been carried out at "the Backs," an area beneath the hotel behind platforms 9 and 10. This has now been cleared of the paraphernalia which made it an eyesore, and made more inviting by re-decoration, panelled walls, and improved lighting. A snack bar now occupies the site, on the east side, of the former lost property office, which now adjoins the main-line cloak room. Other facilities provided are: an additional tobacco kiosk on the west side footbridge; a new tobacco and confectionery kiosk (replacing a smaller one) on No. 9 platform; and two new shops (replacing a fruit stall) near an entrance to the Central Line on the east side.

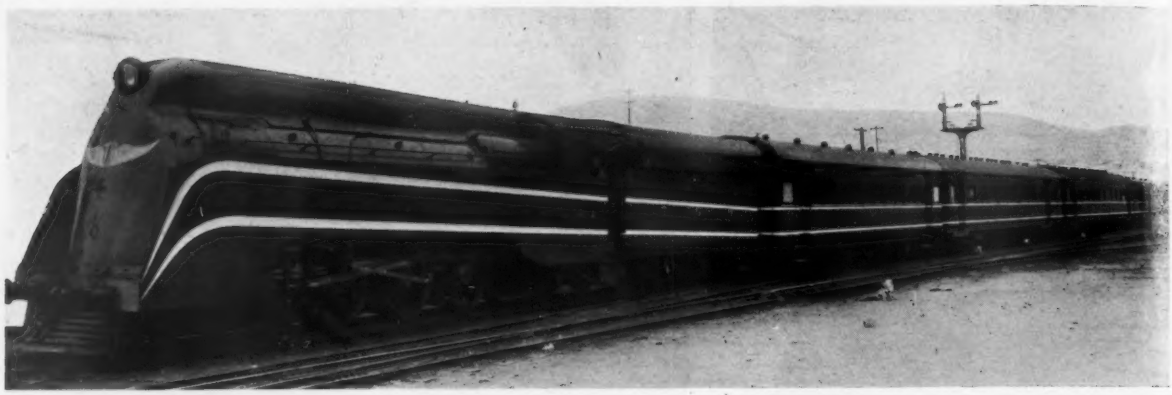
The effect of these improvements and clearances has been to enlarge the area of the concourses, afford greater freedom of movement, and make for more harmony in appearance. An interesting discovery was made during the cleaning of the brickwork on the east side, which was opened in 1894. Eight panels, bearing in relief representations of various railway activities, came to light. Two panels of similar design are in a position where they can easily be seen by passengers, but the eight brought to light are placed high up above the booking hall windows and have probably been unobserved for years.

Left: Old kiosk on No 9 platform, and (right) new and more pretentious kiosk on same site

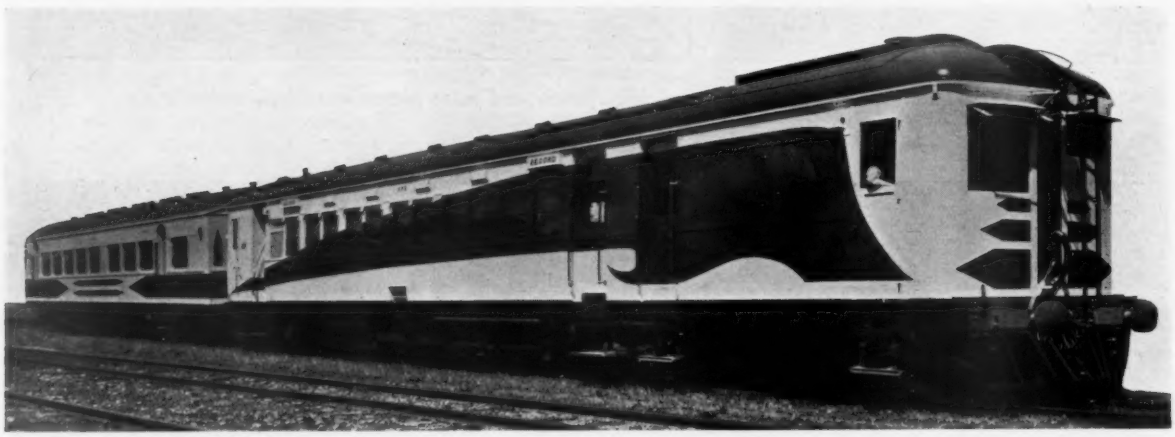
East side, showing concourse cleared of unnecessary obstructions; also new shops and improved barriers

IMPROVEMENTS AT LIVERPOOL STREET STATION, L.N.E.R., IN 1938

(See article opposite)



Streamlined Pacific type locomotive and all-steel train, with buffet car, for the Hobart-Launceston express service



Sentinel-Cammell steam railcar with buffet car as trailer as used on the evening services between Hobart and Launceston and between Launceston and Burnie

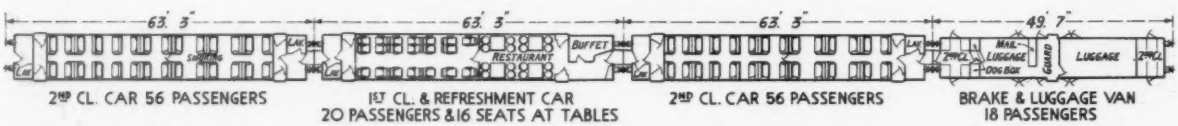
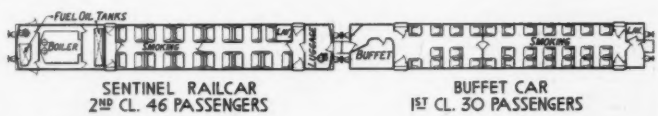
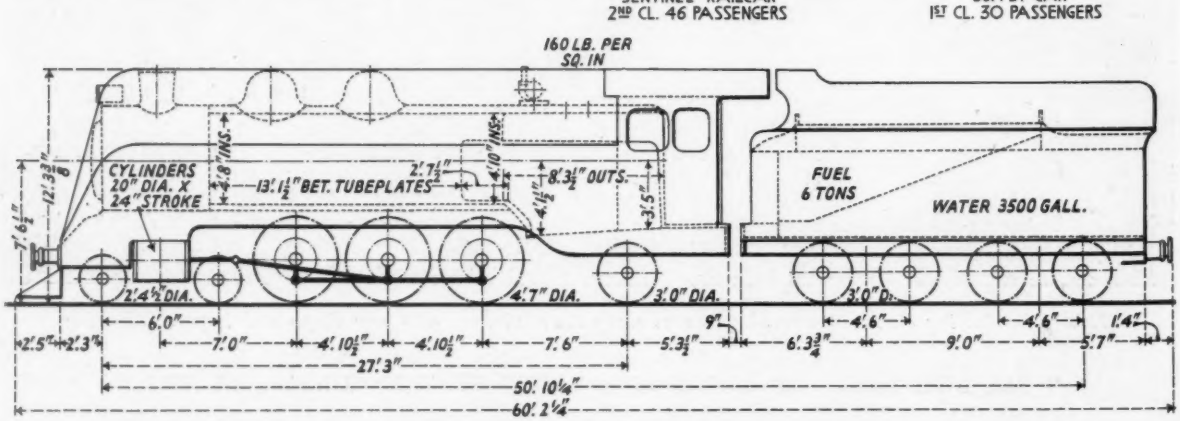


Diagram of seating and refreshment accommodation on the two types of train illustrated above





Outline diagram of 4-6-2 type streamlined locomotive and tender used on the Hobart-Launceston service

STREAMLINED TRAINS IN TASMANIA

Main line express traffic between Hobart and Launceston is now worked with streamlined Pacific locomotives and trains, and with Sentinel steam cars with buffet car trailers

CONFORMING to the general policy of reconditioning the rolling stock and operating plant of the Tasmanian Government Railways, improved passenger services have been introduced on the principal lines in the State. On the main line between the capital (Hobart) and Launceston, modern luxury streamline trains are used for the day express services. This rolling stock has many features departing from previously accepted standards of coaching stock in this State.

The streamlined train is hauled by a Pacific type locomotive attractively streamlined and fitted with many new features including roller bearings to all journals of engine and tender, except those on the coupled wheels. The rolling stock has been constructed in Australia to the maximum running dimensions of the Tasmanian Railway Department, which permits body dimensions approximately equal to those on the wider standard gauges, although the gauge in this State is only 3 ft. 6 in. The coaches are 63 ft. 3 in. overall, and of all-steel construction with exceptionally wide window openings, largely for the benefit of tourists. Both first and second class carriages are identical in construction and internal decoration, lighting, &c., but the second class is arranged with different seating to carry more passengers. SKF roller bearing axleboxes are also used throughout. Electric power (Stone's system) is used for lighting and all heating of cooking appliances in the buffet compartment. The first class cars have a restaurant compartment fitted with tubular framed tables and café chairs and a buffet compartment with provision for cooking light lunches.

Special attention has been given in designing the running gear of the cars with a view to providing adequate springing to absorb shocks and vibration transmitted from the road. Rubber shock absorbers are used extensively for this purpose. Rubber flooring is also provided throughout the cars.

Seating in the first class is in the form of individual tubular-framed movable lounge chairs. Seat framing and all fittings are chromium plated and the panelling is in polished Tasmanian blackwood. The second class seating is arranged with double seats with individual cushions, and tubular frames; the finish is bronze lacquer.

Hitherto, intercommunication has not been provided in Tasmania owing to the difficult nature of the track, but has been arranged in the streamlined trains after special consideration had been given to the many operating conditions pertaining. The external painting throughout the train is a pleasing tone of dark green lined with cream and presents an attractive appearance.

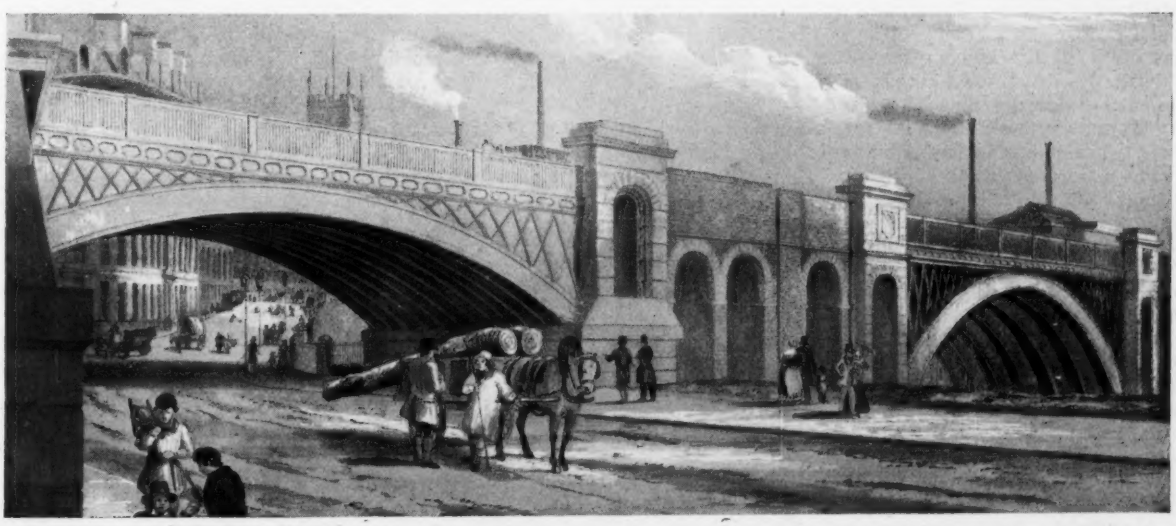
The main line over which the trains operate is about 134 miles in length, and for a large part traverses semi-mountainous country, raising to an elevation of 1,600 ft., the maximum grades are 1 in 40, and 5-chain radius curves abound on the hilly portions of the line.

Sentinel Railcars with Buffet Trailers

Further improvements providing for increased and more convenient services with modern coaching units have been made by the introduction of Sentinel-Cammell railcars with buffet cars attached as trailers. The units have been designed on modern lines, affording the maximum comfort and convenience to passengers.

The power units are 200-300 h.p. Sentinel-Cammell cars, each driven by two six cylinder Sentinel engine sets, and steam is supplied by a high-pressure oil-fired tubular boiler. The trailing car is similar to the buffet car used on the streamlined train as before described. Tubular-framed seating having individual cushions is provided in the power unit, and a very effective lighting system is provided throughout both cars, using Luxton wall and roof electric light fittings giving brilliant lighting. A complete system of visual bell signals throughout the train has been installed for passengers to call the conductor.

The Sentinel-Cammell and buffet car units operate the evening passenger services between Launceston and Hobart and between Launceston and Burnie, 112 miles.

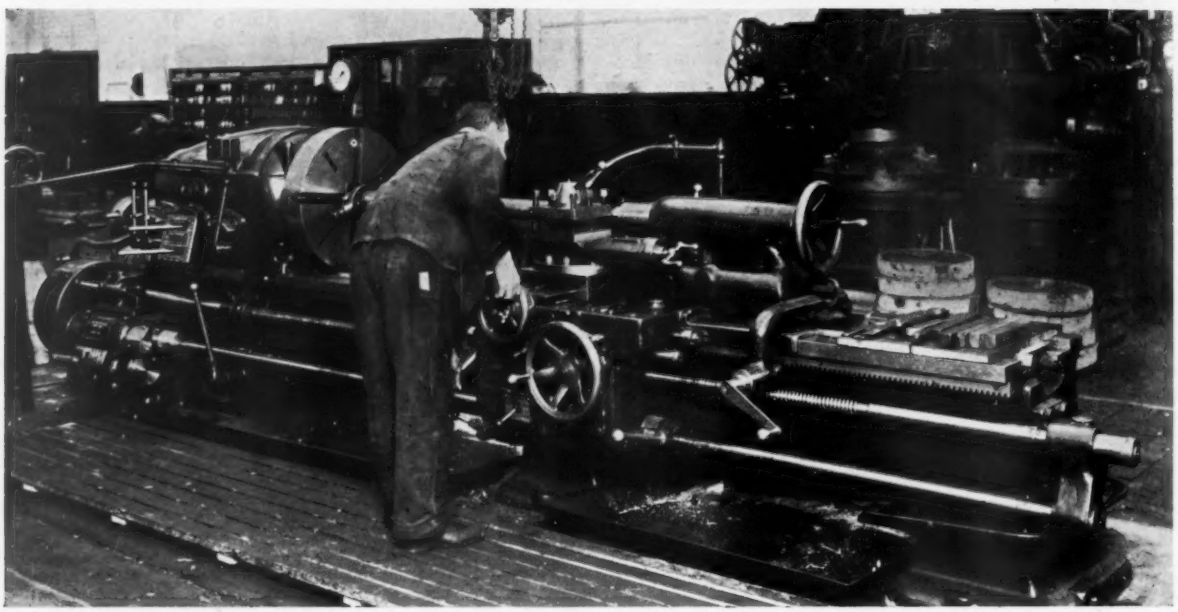


View of 1841 *showing Manchester & Leeds Railway bridge over the River Irwell at Manchester*

MACHINE TOOLS AND OPERATIONS AT ST. ROLLOX WORKS, L.M.S.R.—I

New equipment installed in accordance with work-planning system

DURING a recent visit to the St. Rollox works of the London Midland & Scottish Railway, we noted that several new machine tools had been installed for carrying out various operations, in accordance with the work planning system there used. Two 24-in. Lang sliding, surfacing, and screwcutting lathes have been installed for the machining of piston rods, valve spindles, and similar work. These machines were specially designed for use with tungsten-carbide tipped tools, and have a cutting speed of 300 ft. per min. for roughing, whilst finishing is carried out at 420 ft. per min., giving an exceptionally fine finish. The machines are fitted with taper turning attachments, all-geared head and quick-change gearboxes, and by their use a saving of approximately 25 per cent. has been effected as compared with the ordinary centre lathes previously used for this work.



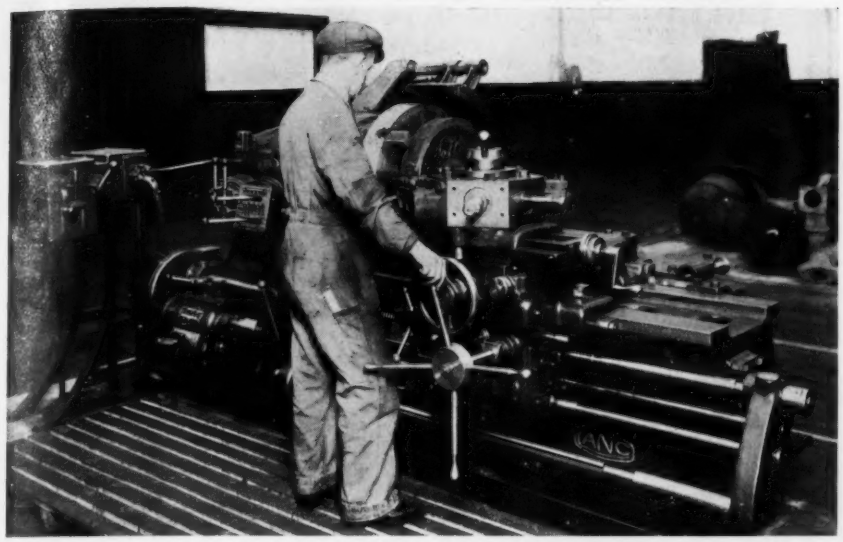
Screwing the piston rod for an L.M.S.R. "5P5F" 4-6-0 locomotive on a Lang 24-in. swing surfacing and screwcutting lathe

Piston heads are finished on a 26-in. Lang surfacing, boring, and screwing machine, also using tungsten-carbide tools. This machine has a taper turning attachment set at the same angle as those on the 24-in. lathes, thus ensuring a perfect fit when the head is assembled on the rod. The two machines are illustrated by courtesy of Mr. W. A. Stanier, Chief Mechanical Engineer. The 24-in. machine is driven by a 20-h.p. motor, and is shown screwing a piston rod for a locomotive of the "5P5F" class, using a Herbert external chaser. The 26-in. machine is shown at work on a Class 2 passenger engine piston of 19 in. dia.; this is being machined with Wimet tools for roughing and finishing operations, at a spindle speed of 30 r.p.m. and 60 c.p.i. feed. The machine is driven by a 15-h.p. motor, and is equipped with quick traverse motion to the saddle.

Repairing Boiler Tubes

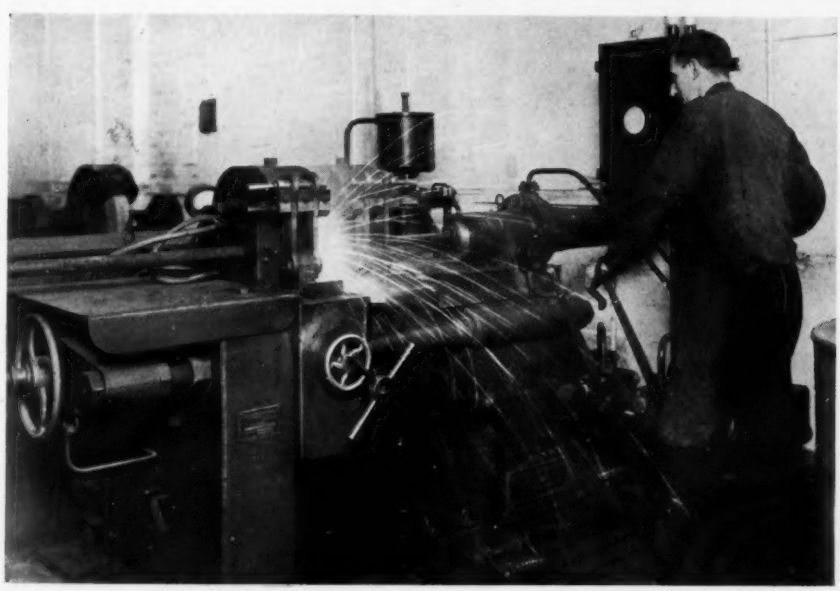
A complete layout for progressive repairing of both small and superheater flue tubes has recently been installed at St. Rollox. The tubes, after removal from the boilers, are first passed through a reeling machine for straightening and cleaning, and then reduced to a predetermined length by two cold saws, each end being trimmed in turn. The tube is then ground at one end and placed in the butt welder, where a new piece of tube is welded on to restore it to its original length. Both the tube and the new end are held in the machine by hydraulically-operated clamps, one of which is fixed whilst the other is mounted on a slide attached to a hydraulic ram. The movement of this ram is controlled by a cut-off switch which can be adjusted to give the width of weld required. The upset which is left inside the tube after welding is removed automatically by a hydraulic stripping tool as soon as the weld is complete, and the external upset is then ground off in the next operation. The time taken to weld small flue tubes by this system is 10 sec., whilst superheater tubes are dealt with in 12 sec. Extensive tests of repaired tubes show that only 1 per cent. failed at the weld. The butt welding machine illustrated was manufactured and supplied by the A.L. Electric Welding Appliances Company.

The introduction of screwed superheater flue tubes has necessitated the installation of a special machine made by Kendall & Gent (1920) Ltd. for turning and screwing the tubes, and this machine is also illustrated at work. The headstock is fitted with two spindles, one of which carries a Herbert tangential diehead, the other having a holder with five turning tools for truing up the outside diameter of the tube. The headstock, mounted on a slide, can be positioned to bring either the tool box or the diehead into its working position by means of compressed air. The illustration shows a superheater flue tube $5\frac{1}{8}$ in. dia. held in vee blocks and centralised by a conical gauge and adjustable vice. The minimum diameter of the screwed portion is $4\frac{1}{16}$ in., eleven threads per in.



Left : Work in progress on a locomotive piston with a Lang 26-in. swing surfacing, boring, and screw-cutting lathe

Right : Kendall & Gent machine for turning and screwing superheater flue tubes



Left : Welding new portion on to a boiler flue-tube with a butt-welding machine of the Electric Welding Appliances Company

The new Potsdamer Platz station of the Berlin Nord-Süd Bahn, opened on April 15. This new underground line of the Reichsbahn connects the Stettiner station in the north of the city with the Potsdamer and Anhalter stations in the south. The upper picture shows the sub-surface booking hall and stairways to the platforms seen in the lower picture

Reconstruction of Mile End station, L.P.T.B. Above : The eastbound tunnel and site of platform of the Central Line. The roof girders were carried through the old retaining wall, now being demolished, in the 6-ft. tunnels shown in the picture on the right. *(See article on page 665)*

RAILWAY NEWS SECTION

PERSONAL

Mr. C. R. S. Harris, whose retirement from the position of Director-General of the Buenos Ayres Great Southern and Western Railways was recorded in our issue of March 31, is the son of Sir Charles Harris, G.B.E., K.C.B., late Permanent Head of the Finance Department at the War Office. He was born in 1896 and educated at Clifton, where he obtained a scholarship at Corpus Christi College, Oxford. He took a First Class Lit. Hum. degree in 1920 and became a Visiting Fellow of Princeton University, of which he is a Ph.D., as well as being an M.A., and D.Phil. of Oxford. From 1930–35 Mr. Harris was Editor of the *Nineteenth Century and After* and was also a staff writer on economics and finance, including railway matters, on the editorial staff of *The Times*, from 1925. He has, moreover, been a regular contributor on railway matters to the *Economist*. In 1935 he was appointed a Member of the local boards of the B.A.G.S. and B.A.W. Railways, and in June of that year, on his arrival in Argentina, assumed the title of Director-General of both systems.

Mr. C. R. S. Harris
Director-General, B.A.G.S. and B.A.W. Railways, 1935–1939

Major O. Loewenthal
Appointed General Manager, B.A.G.S. and B.A.W. Railways

Major O. Loewenthal, who as recorded in our issue of March 31 has been appointed General Manager of the Buenos Ayres Great Southern and Western Railways, was educated in England and Switzerland. Thereafter he was employed successively as Assistant Engineer with the Tehuantepec Isthmus Railway, Mexico, with the Mexican National Railways, and as Chief Construction Engineer of the Real del Monte Mining Company, Mexico. Later he served with the North-Western Railway of Brazil, the Leopoldina, and the Puerto Victoria Railways as Construction Engineer. He was subsequently appointed Chief Engineer and Assistant General Manager of the Madeira-Mamore Railway, Brazil, vacating this position to become General Manager of the Southern São Paulo Railway. His next post was that of General Manager of the Transandine Railway, and in January, 1929, he was appointed General Manager of the Entre Rios and Argentine North Eastern Railways, which position he vacated in 1936 to become Manager, B.A.G.S. and B.A.W. Railways. Major Loewenthal is a Director and representative of the financial committee of the second debenture holders of the Buenos Aires Central Railway; and a Local Director of the Argentine Transandine Railway.

Mr. Robert B. Jones has been promoted to be Engineer of Track, Canadian Pacific Railway. He was born in Glasgow in 1885, and obtained his early railway experience in England. In 1910 he joined the Grand Trunk Pacific (now part of the C.N.R.) as a draughtsman, afterwards became an Inspector of Works, and eventually was engaged on preliminary and location survey in Saskatchewan. In 1913 he transferred to the C.P.R. as a draughtsman. During the war he served overseas in the Canadian Field Artillery, rising from Gunner to Lieutenant. On return to the C.P.R. in 1919 Mr. Jones was appointed an Assistant Engineer in the Office of the Chief Engineer, and it is this position from which he is now promoted Engineer of Track.

Mr. D. McQueen, whose appointment to succeed Mr. W. A. Graham as Superintendent Marine Engineer, Southampton, Southern Railway, was reported in our issue of April 14, was

Mr. D. McQueen

Appointed Superintendent Marine Engineer, Southampton, Southern Railway

Elliott [*& Fry*

Mr. C. K. Bird

Appointed Assistant Divisional General Manager, Southern Area, L.N.E.R.

Thos.] [*Fall*

Mr. Alfred Oldham, O.B.E.

Assistant Divisional General Manager, Southern Area, L.N.E.R., 1925–39

educated at Birkenhead Institute. He served his engineering apprenticeship at the Birkenhead Corporation Marine Works, and Cammell Laird & Co. Ltd., Birkenhead. In 1909 he was appointed Junior Engineer, Pacific Steam Navigation Co. Ltd., and four years later he returned to Cammell Laird & Co. Ltd. as Assistant to the Engineering Repair Works Manager. During the war Mr. McQueen served as a Warrant Engineer in the Navy. After he was demobilised in 1919, he was appointed to the Technical Staff of Alfred Holt & Company (Blue Funnel Line). In 1926 he went to take up the position of Superintendent Engineer to the Southern Railway Marine Department, Dover and Folkestone Fleet, and in 1930 was appointed non-Exclusive Ship and Engineer Surveyor to Lloyd's Register of Shipping for the Port of Dover. It is from Dover that he has gone to take up his new post at Southampton. Mr. McQueen is a Member of the Institute of Marine Engineers and a Member of Council of the British Coal Campaign.

Mr. C. K. Bird, who, as announced in our issue of April 14, has been appointed Assistant Divisional General Manager, Southern Area, L.N.E.R., in succession to Mr. A. Oldham, was born in 1897. He was educated at King's School, Grantham, and Cambridge, where he was Scholar and Exhibitioner of St. John's College; Mr. Bird took First Class Honours in Part I of the Mathematical Tripos and was placed as Wrangler in Part II. He served during the war with the Honourable Artillery Company and the Royal Artillery, and was awarded the Military Medal. Mr. Bird joined the old North Eastern Railway in 1922, gaining experience in the Commercial and Operating Departments in the head offices at York, and subsequently at outside stations. In 1926 he was appointed Chief Staff Clerk to the District Superintendent at Leeds, L.N.E.R., and in 1928 to a similar post at Middlesbrough. In July, 1928, he was transferred to the Rates Office, York, where he represented the North Eastern Area on the Clearing House Classification and Container Committees. In 1929 Mr. Bird was appointed Assistant to the Chief General Manager for Rates and Statistics, and in 1932 also became responsible to the Chief General Manager for Parliamentary matters. In 1934, Mr. Bird was appointed Assistant Goods Manager, Southern Area, the position he will now relinquish.

Mr. Alfred Oldham, O.B.E., who, as recorded in our issue of April 14, will retire on April 29 from the position of Assistant Divisional General Manager, Southern Area, L.N.E.R., was born at Gee Cross, Cheshire. He entered the service of the then Manchester, Sheffield & Lincolnshire Railway in September, 1889, as a probationer, and was subsequently appointed a junior clerk in the Superintendent's office. Here he obtained a wide and varied experience, passing through the several sections of the office, and eventually rising to the position of Chief Clerk. Mr. Oldham left the Traffic Department in July, 1914, on being appointed Chief Clerk to the General Manager, but during the same year spent a short period in the North as an Assistant to the Manchester District Traffic Manager. Towards the end of 1914, Mr. Oldham returned to the General Manager's Department as Personal Assistant to Sir Sam Fay.

Mr. J. R. W. Grainge

Electrical Assistant to C.M.E., Great Western Railway, 1924–39

Mr. M. MacDonald

Appointed Electrical Assistant to C.M.E., Great Western Railway

During Sir Sam Fay's tenure of office as Director of Movements and Railways, Mr. Oldham spent a considerable amount of time at the War Office in connection with military railway questions, whilst also covering his important duties at Marylebone. In 1919 he was appointed Assistant Superintendent of the Line, Great Central Railway. On the formation of the L.N.E.R., Mr. Oldham was appointed Assistant to the Chief General Manager, L.N.E.R., in charge of Parliamentary and works matters, and became Assistant Divisional General Manager, Southern Area, in 1925.

Mr. J. R. W. Grainge, who, as announced in our issue of March 31, is retiring on April 29 from the position of Electrical Assistant to the Chief Mechanical Engineer, Great Western Railway, has occupied that position since March, 1924. Mr. Grainge was trained as an engineer at the Regent Street Polytechnic and served a five-year engineering apprenticeship in the Londonderry Locomotive and Marine Engine Works at Seaham Harbour, and in the London & South Western Railway locomotive works at Nine Elms. At the conclusion of his engineering apprenticeship he went to sea and obtained a first-class Board of Trade certificate. After studying electrical engineering, he joined the Charing Cross & Strand Electricity Supply Company, and subsequently occupied the positions of Engineer-in-Charge, Battersea Municipal Power Station, and Chief Electrical Assistant to the Erith Urban District Council. In August, 1906, he joined the Great Western Railway as Chief Assistant to the Resident Electrical Engineer at Park Royal, and passed successively through the positions of Resident Electrical Engineer at Park Royal and Chief Assistant to the Chief Electrical Engineer at Paddington. In 1924 Mr. Grainge was appointed Electrical Assistant to the Chief Mechanical Engineer and has held that position until the present date. Mr. Grainge has served on the committees set up by the G.W.R. to inquire into electrification on parts of the company's main and suburban lines. He is a member of several engineering committees of the Railway Clearing House and is on the Railway Engineering panel of the British Electrical and Allied Industries Research Association. He has also represented the G.W.R. on the West Midland Joint Electricity Authority for the past thirteen years up to the date of his retirement. He is a member of the Institution of Electrical Engineers.

Mr. M. MacDonald, A.M.I.E.E., whose appointment to succeed Mr. J. R. W. Grainge as Electrical Assistant to the Chief Mechanical Engineer, Swindon, G.W.R., was recorded in our issue of March 31, was educated at Westminster School. After receiving electrical training at Faraday House, Mr. MacDonald went for mechanical and electrical practical training to the works of Belliss & Morcom Limited, and the General Electric Co. Ltd., both of Birmingham. In 1906 he joined the G.W.R. Electrical Engineer's Department at Paddington as assistant to Mr. Roger T. Smith. The Electrical Engineer's Department was merged in 1924 with the Chief Mechanical Engineer's Department, and Mr. MacDonald was transferred to Swindon as assistant to Mr. J. R. W. Grainge, who was then appointed Electrical Assistant to the Chief Mechanical Engineer, Mr. C. B. Collett. It is from this latter position that Mr. Grainge will retire on April 29, and will be succeeded by Mr. MacDonald.

The late Sir Thomas O. Callender, Deputy Chairman and Managing Director of Callenders Cable & Construction Co. Ltd., left estate valued at £383,276 (£344,237 net). Sir Thomas Callender died on December 2 of last year, as recorded in our issue of December 9.

Sir Henry Chapman, who retired in 1938 from the general managership of the Rhodesia Railways, has been appointed a Director of the British South Africa Company.

Mr. H. Wilmot, Managing Director, and Mr. W. Cyril Williams, Sales Director, of Beyer, Peacock & Co. Ltd., Mr. H. H. Saunders, General Manager of the Vulcan Foundry Limited, and Mr. Keith Pearson, Director of Robert Stephenson & Hawthorns Limited, have returned from their visit to Ankara, the capital of Turkey, where on April 11, a contract was signed for 58 heavy freight 2-10-0 locomotives; 24 to be built by Beyer, Peacock & Co. Ltd., 24 by the Vulcan Foundry Limited, and 10 by Robert Stephenson & Hawthorns Limited, as recorded in last week's issue.

Rebuilding Mile End Station, L.P.T.B.

Under the Mile End Road what will be one of the most important Underground interchange stations in London is now being built by reconstructing the existing Mile End station on the District Line so that Central Line trains may also use it when they are projected beyond their present eastern terminus at Liverpool Street. When the extensions of the Central Line have been completed, it will run from Ruislip and Denham in the west to Ongar, Epping, and Hainault in the east. By walking across a platform at Mile End, passengers will be able to change between Central, District, or Metropolitan Line trains. The railways serving the new Mile End station directly will be 105 miles long. It is estimated that 55,000,000 passengers will converge on the station every year, and that the new interchange facilities will be used by 11,000,000 people a year.

There will be little left of the old Mile End station, built for steam trains in 1902. The present booking hall will have gone and modern entrances will lead to a new ticket hall housing the latest machines for selling tickets rapidly. From the new ticket hall, bridges will lead to stairs to the two new island platforms.

Intricate planning has been necessary to avoid interference with traffic during reconstruction. On the northern side the work has extended under the Mile End road right to the opposite pavement, yet not more than very small areas of the road have been disturbed. The weight of the roof girders of the existing station has been transferred to new steel columns. Through and beyond the old northern retaining wall, in line with each of the old roof girders, a tunnel 6 ft. in diameter was driven. At the northern end of each tunnel two reinforced concrete piles were sunk. Forty headings of this type were driven. The soil between them was consolidated chemically. In each heading a steel girder was erected, resting at the one end on the concrete piles, and bolted at the other end to the new steel columns. The soil was then excavated between the 6-ft. tunnels and special segments were erected to span between them. The girders in the headings were concreted in, and the lower segments of the tunnels removed. A new concrete retaining wall was made surrounding the concrete piles at what will be the northern side of the new station. The top halves of the tunnels, with the special segments between them, form the new roof of the extended station. The dumpling of ground between the old and new retaining walls has now been removed to make room for the construction of the new eastbound Central Line platform and track.

On the south side the procedure has been similar, with some complications. A number of buildings have had to be carried on girders. The contractors have used for a working shaft the old smoke hole provided to carry away the smoke of the tormer steam trains.

When the works have been completed, a Central Line train westbound from Stratford to Liverpool Street will leave the surface at Stratford and enter a tunnel. The tunnel passes under the District Line tunnel near Bow Road station and rises to platform level at Mile End station, which is 25 ft. below the street. After leaving this station the tunnel dips to a depth of 60 ft. from the surface, again passing under the District Line tunnel, this time west of Mile End station, rising to run into Bethnal Green station, which is 52 ft. down, and then on to Liverpool Street.

XUM

The L.N.E.R. "Meet the Sun" Campaign

A new scheme in operation throughout the system urges the advantage of travelling eastward for a holiday

When Mr. Phileas Fogg made his journey round the world in eighty days, he travelled eastward to meet the sun. Readers of Jules Verne will remember that by so doing he gained twenty-four hours, winning his wager even when all seemed lost. To go and meet the sun instead of sitting down to wait for it is therefore a form of enterprise shown by literary precedent to be rewarded.

At the present moment thousands of prospective holidaymakers are being urged to "Meet the Sun on the East Coast," and no doubt derive optimism from the prospect of setting out to find holiday weather rather than passively accepting what our climate brings. The L.N.E.R. "Meet the Sun" campaign was launched on April 3. It has been conceived to outweigh possible prejudice against East Coast or East Anglian holidays on the grounds that the bracing climate in that part of the country may not be inseparable from chilly winds.

By its geographical layout the company has an indisputable proprietary right to its chosen slogan. In driving it home to the public, advantage is being taken of the fact that in recent months the "square deal" propaganda has shown how efficacious departures from stereotyped publicity methods may be. Therefore the traveller now sees the "Meet the Sun" slogan and device displayed all over the L.N.E.R. system in booking office windows, on ticket barriers, and proclaimed by banners and streamers in station concourses. In the streets it can be read on the sides of the company's motor vehicles, and by co-operation with municipal authorities it appears in the newspapers not only in connection with the company's own publicity, but also where resorts advertise their individual attractions. This is the most intensive campaign yet undertaken by the company on its own account, and is being given greater importance in the current year's publicity programme than the customary pictorial advertising.

The "Meet the Sun on the East Coast" slogan is expressed in a variety of forms and sizes for different purposes, all incorporating a picture of the sun smiling at the discerning holidaymakers who have come to meet it. As a black-and-white "totem" it is incorporated into the small newspaper advertisements of resorts as already mentioned. This is a mutual benefit idea that promotes cordial relations with the resorts, who share without expense in the pulling-power derived from their publicity being endorsed by the railway company. A measure of the welcome the scheme has had from the resorts concerned is the large number—some hundred thousand—of coloured "Meet the Sun" stamps distributed by the railway to municipal authorities, hotels and boarding house keepers, and others, for attaching to correspondence with prospective visitors. An important holiday camp and amusement

Standard poster with pictorial surround and white panel for insertion of excursion notices

The "Meet the Sun" slogan as it is now being incorporated with excursion handbills (left), coloured stamps for correspondence (centre), and existing pictorial posters by addition of seal on right. Some hundred thousand of the stamps illustrated have been distributed to municipal authorities, hotels, and boarding house keepers

YOUR HEALTH COMES FIRST, SO—
MEET THE SUN ON THE EAST COAST
CLEETHORPES
MUST ALWAYS COME FIRST
Read all about Lincolnshire's Health Gift to Britain in the 1939 Holiday Guide—free from H. A. INGHAM, Dept. — Town Hall, Cleethorpes. Cheap Monthly Return Tickets issued to Cleethorpes, L·N·E·R. Any train. Any day. TRAVEL BY RAIL.
FELIXSTOWE
ON THE BEAUTIFUL SUFFOLK COAST FOR HEALTH AND PLEASURE—BATHING—TENNIS—GOLF—YACHTING—FIRST-CLASS ENTERTAINMENTS AND ORGANIZED SPORTS AND GAMES
GUIDE FREE From Dept. , Information Bureau, Felixstowe, or any L·N·E·R Enquiry Office. CHEAP MONTHLY RETURN TICKETS — ANY DAY — ANY TRAIN
It's Quicker by Rail!
MEET THE SUN IN EAST ANGLIA

Newspaper advertising by resorts, incorporating "Meet the Sun" device

park organisation is using the "Meet the Sun" device in its literature and on a special poster.

The railway company's own advertising incorporates the "totem" in numerous ways. Newspaper advertisements advertising general facilities carry a similar one to that used by the resorts, and the same design appears in white on a coloured ground across the bottom of posters announcing specific half-day trips to East Coast centres. Excursion handbills now display the slogan in place of the former diagonal coloured band with "L.N.E.R. Half-Day Excursion" lettering in the top right-hand corner. For poster advertising of general travel facilities, such as monthly return, or zone travel tickets, or of monthly excursion programmes for resorts, a "Meet the Sun" surround is used, enclosing a space for display of the relevant information. In addition, a special "Meet the Sun" poster by "Bossfield" is being extensively exhibited. With its cheerful colouring and beguiling sketches of holiday recreations, this epitomises the intention of the campaign and prepares the way for receptive study of travel and fare facilities announcements. The pictorial posters for which the L.N.E.R. is noted are, of course, still playing their part in the company's advertising. Those relating to East Anglian centres are linked up with the campaign by bearing a small circular stamp with the sun device and slogan.

The "Meet the Sun" campaign is flexible in conception, so as to be free to take advantage of topical ideas and new devices suggested by experience. As soon after Easter as possible a special poster was produced showing how largely East Coast resorts had shared in the sunshine at that season. Similarly, the key slogan is varied to embrace East Anglia as a whole as well as its coastline, a measure that has been productive of co-operative newspaper advertising between the railway and a caterer for holidays on the Norfolk Broads.

EASTER WEEK-END SUN RECORDS

NUMBER OF SUNSHINE HOURS

	GOOD FRIDAY	EASTER SATURDAY	EASTER SUNDAY	EASTER MONDAY	EASTER TUESDAY
CLACTON-ON-SEA	11.1	7.3	10.4	10.7	10.6
FELIXSTOWE	10.6	6.4	10.6	11.8	11.1
LOWESTOFT	10.7	11.4	11.2	10.4	11.2
GREAT YARMOUTH	11.0	6.9	11.1	10.4	11.2
CROMER	5.9	6.5	10.1	11.4	11.7

—WERE YOU THERE?

Special poster produced after the Easter holiday. The heading design is similar to that used in other sizes for booking office windows, ticket barriers, and road vehicles

"Key" poster of the "Meet the Sun" campaign

Electric Lamps for Signalling

Members of the Institution of Railway Signal Engineers, meeting at Liverpool on April 19, listened to an instructive paper by Messrs. J. C. G. Vowler and P. J. Sturges on the design of electric lamps for signalling purposes, a subject of considerable importance now that light signalling is being so much extended. The authors dealt with the development of the electric lamp for ordinary purposes and explained many interesting points connected with manufacturing processes, now very highly developed and involving considerations little known beyond the immediate circles concerned. The special characteristics of lamps recommended for use in light signals were also treated in an informative manner, the different forms of lamp evolved since such signals began to become popular being touched on.

The paper was a fitting continuation, as it were, of that read by Mr. J. E. Candler in London on January 25, 1939, when the optical details of lenses and other items were dealt with. It served once again to emphasise the part played by scientific and manufacturing research in perfecting processes which have made the light signal the reliable and efficient element in modern signalling it now is. The elaboration of signalling principles is one thing, their sound practical realisation another, and in that task signal engineers have been greatly aided by the skill of manufacturing engineers such as the authors of the paper in question.

Forthcoming Events

Apr. 22 (*Sat.*).—Permanent Way Institution (Manchester-Liverpool), at District Goods Manager's Office, Bolton, 3 p.m. "Relaying a Junction," by Mr. G. Ashcroft.
Stephenson Locomotive Society (Midlands-Northern), 2.30 p.m. Visit to Doncaster Running Sheds, L.N.E.R.

Apr. 25 (*Tues.*).—Institute of Transport (Leeds Graduate), at City Transport Department, 7 p.m. Annual General Meeting.

Apr. 27 (*Thurs.*).—Railway Students' Association, at London School of Economics, Houghton Street, W.C.2, 6 p.m. Annual General Meeting.

Effective Railway Propaganda

An excursion of 800 boys from London to Crewe included specially arranged items of railway interest

A sightseeing trip to Crewe works, arranged by the Crusaders' Union in conjunction with the London Midland & Scottish Railway on Monday last, is believed to have broken more than one record. The party of nearly 800 boys, drawn from public, public secondary, and private schools, is the largest ever handled at Crewe on a single day. For the first occasion in connection with a half-day excursion trip, also, "XL" limit timings were arranged, and these are understood to be the fastest half-day excursions of their length that have yet been run. The first train, conveying about 500, was provided with a streamlined "Coronation" class Pacific, and was booked over the 158·1 miles from Euston to Crewe in 155 min., at 61·2 m.p.h.; the second train, with a "Royal Scot" 4-6-0, called at Watford to pick up a contingent from North-West London, and was timed over the 140·7 miles from there to Crewe in 140 min., at 60·3 m.p.h.

On the return journey arrangements were made that each special train should be in a position from which the boys might see the up Coronation Scot streamlined express running at full speed; very careful timing arrangements were necessary for this purpose, but the aim was achieved by getting the first train on the slow lines between Roade and Wolverton, and the second train on the slow lines between Whitmore and Norton Bridge, from both of which positions a broadside view of the streamliner, travelling at about 80 m.p.h., was obtained. Lunch and tea were served to all participants where they sat, and the two trains incorporated seven kitchen cars for this purpose. For the Crusaders' Union the organisation of the day was in the hands of Mr. Cecil J. Allen.

The handling of this large party at Crewe works, without interference with the normal works routine, was an admirable piece of organisation; the itinerary included the new boiler works, smith's shop, steel foundry, spring mill, forge, coppersmiths' shop, wheel shop, brass finishing shop, brass foundry, tender shop, tube shop, mounting shop, welding shop, fitting and machine shop, and the new erecting shop. After this the boys were conducted to an exhibition of locomotives, including the full-size model of the *Rocket*, the 2-2-2 engine *Cornwall*, and the 2-4-0 "Jumbo" *Hardwicke*, and, to represent the present day, a new "5X" 4-6-0 and a "Royal Scot" 4-6-0, the last-mentioned in steam, and over these the boys were allowed to clamber at will. The tour of the works and the locomotives occupied about 3½ hr. It is of interest that this party was the last to use the large suspension bridge, connecting the station direct with the works, which has been so striking a feature of the north end at Crewe; as the cost of maintenance of this structure is no longer considered justifiable, in view of the limited use to which it is put, the decision has been reached to remove it, and dismantling began on the following day.

As regards the running of the special trains, the first down train, weighing 391 tons tare, and 420 tons gross, was hauled by 4-6-2 No. 6229, *Duchess of Hamilton*, and had to contend with a strong N.W. wind. The running was also hampered by a dead stand for a full minute and a lengthy slowing between Blisworth and Weedon, where single line working was in force owing to the laying in of new 131 lb. per yd. flat-bottom rails in the up line; there was also a number of other slowings, including 40 m.p.h. at Willesden, 25 m.p.h. at Rugby, 55 m.p.h. at Colwich, and 40 m.p.h. at Stafford, with the result that the total journey time for the 158·1 miles was 158 min. 56 sec. But there was some fast running intermediately, the 45·4 miles from Watford to Blisworth taking 39 min. 8 sec. (69·6 m.p.h.), and the 35·8 miles from Shilton to Colwich 30 min. 2 sec. (71·6 m.p.h.), with maximum speeds of 79 m.p.h. at Leighton, 76½ at Castlethorpe, 80½ at Nuneaton, 85 at Polesworth, and 79 at Betley Road. Uphill speeds also were notable, the long 1 in 330 ascents to Tring being surmounted at 61 m.p.h., that to Roade at 64½ m.p.h., while there was an acceleration from Weedon up a similar inclination to 61 m.p.h. past Welton. Net time for the run was 152 min., allowing only for the Weedon slowing. The second train, of 300 tons tare and 315 tons gross, was worked by "Royal Scot" 4-6-0 No. 6123, *Royal Irish Fusilier*, which carried in front of the smokebox a large representation of the Crusader badge. This train ran the 140·7 miles from Watford to Crewe in 139 min. 19 sec., or 137¼ min. net; Lichfield, 98·9 miles, was passed in 95 min. 36 sec. from the start, and 93½ min. net, and the engine was then eased. There were maximum speeds of 75 m.p.h. at Leighton, 76 at Wolverton, 75 at Nuneaton, and 76 at Tamworth, and minima of 61½ at Roade, 58 at Lichfield, and 57 at Whitmore. On the return journey of this train the 22·6 miles from Blisworth to Leighton were run at an average of 71·7 m.p.h., with a maximum of 82 m.p.h. Editorial comment on the propaganda value of such a day appears on page 637.

Questions in Parliament

Shanghai-Nanking Railway

Commander A. Marsden (Chertsey—C.), on April 6, asked the Prime Minister whether he was aware that the Shanghai-Nanking Railway, at present controlled by the Japanese, was now in complete working order and carrying a full load of passengers daily; and what steps he had taken to secure the payment of interest to British bondholders.

Mr. R. A. Butler (Under Secretary of State for Foreign Affairs): The Japanese authorities have refused to allow the inspection of the line by British representatives. It is understood, however, that it is in full working order so far as the track is concerned, but that there is only limited accommodation for passengers on the trains. Repeated representations have been made to the Japanese Government in regard to the British interest in this line, and these representations were renewed by His Majesty's Ambassador at Tokyo on March 24.

L.N.E.R. and Delivery of Shelters

Mr. V. La J. McEntee (Walthamstow West—Lab.), on April 6, asked the Lord Privy Seal if he was aware that the rate of delivery of steel shelters by the L.N.E.R. in areas within the danger zone was only about 50 per cent. of the rate at which it was estimated that they would be delivered; and could he do anything to speed up the rate of delivery.

Sir John Anderson (Lord Privy Seal): I am not aware that any official estimate has been given of the appropriate rate of delivery of steel shelters to any particular area. The rate of distribution is governed by a number of factors and has been increased from 15,125 shelters distributed during the week ending February 25, to 42,310 last week. Arrangements have been made for a still further acceleration of the weekly rate of distribution.

Square Deal Demands

Captain L. F. Plugge (Rochester, Chatham—C.), on April 19, asked the Minister of Transport, if he could now make any statement on the legislation which would be needed to give effect to the railway companies square deal demands.

Dr. Leslie Burgin: I am giving immediate consideration to the report which the Transport Advisory Council has submitted to me in this matter but am not yet in a position to make any statement.

Parliamentary Notes

Progress of Railway Bills

The London & North Eastern Railway (Superannuation Fund) Bill was read a third time and passed in the House of Commons on April 18.

The London Midland & Scottish Railway Bill passed the report stage in the House of Commons on April 18.

A second reading in the House of Commons was given to the Mumbles Pier Bill (Lords) on April 19.

STAFF AND LABOUR MATTERS

Railway Shopmen: Negotiating Machinery

As a result of a decision of the governing body the National Union of Railwaymen has given notice to withdraw from the present scheme of Negotiating Machinery for Railway Shopmen, and at a national conference held in London on April 1 and 2 adopted the following scheme as an alternative to the existing machinery:

OBJECT

To replace the previous scheme of machinery by establishing direct negotiations, in accordance with the decision of the 1938 National Shopmen's Conference, and the 1938 annual general meeting. Further, to afford full facilities for discussion and settlement of all questions relating to rates of pay, hours of duty, and general conditions of all National Union of Railwaymen shop employees of the railway companies in Great Britain.

CONSTITUTION

In each shop or depot, shop stewards or shop committees shall be elected annually by the members concerned; such election to be confirmed by the respective branches. All shop stewards or shop committees shall be responsible to the branch or branches they represent, and shall report to and take instructions from same. Where necessary, there shall be an area, divisional, or line committee elected by and from the branches in the area, division, or line concerned. All expenses incurred by branches in the election of area, divisional, and line committees, or any such conferences to further the machinery, shall be borne by head office.

PROCEDURE

The duty of the shop stewards or shop committees shall be to safeguard the interests of the members in their shop or depot by negotiating claims and grievances with their respective foreman or official in charge of the shop. Failing a satisfactory settlement, the case shall be reported to the branch or branches concerned, who shall, if necessary, give instructions for the claim to be pursued by the branch representatives to the local manager.

In the event of failure to establish the claim, the branch or branches may if they so desire refer the claim to the area, divisional, or line committee, for negotiation with the appropriate company's representative. If the claim is not conceded at the previous stage, the branch or branches may at their discretion refer the matter to the executive committee of the union. The procedure relative to national questions shall be determined by the National Executive Committee, or annual general meeting. A time limit of seven days be placed on all replies to complaints or applications on each step of the machinery.

The decision of the National Union of Railwaymen to withdraw from the scheme of negotiating machinery for railway shopmen does not affect the other unions parties to the machinery, who, it is understood, have not expressed any desire to withdraw, and the existing machinery will presumably continue to function without the National Union of Railwaymen.

Decision of Railway Staff National Tribunal

Mr. J. Marchbank, General Secretary of the National Union of Railwaymen, writing in last week's issue of the *Railway Review* on the results of the delegate conference on the award of the Railway Staff National Tribunal, says "that it was unfortunate from every standpoint that the questions the union had to raise with the companies came at a time at which decisions had to be taken when the international crisis assumed its most menacing aspect."

"Nobody," declares Mr. Marchbank, "would deplore more deeply than I should any exacerbation of an industrial dispute in present circumstances. When the peace of the world is jeopardised from day to day, and almost hourly, by the brutal and lawless action of the predatory Powers, the National Union of Railwaymen does not willingly add to the nation's burden of anxiety; but I should be neglecting my duty if I did not warn the railway companies and the Government, as well as the public generally, that the instruction which the Union executive and officers have received from the special general meeting is clear and definite.

"We have been instructed to re-open negotiations with the Railway Companies to secure the 50s. weekly minimum and are quite determined to obtain this minimum for the lower paid membership. The union's firmness on the point is proved by its decision to reject the entire award of the Railway Staff National Tribunal. Other claims we made are subordinated now to the 50s. minimum claim.

"The claim is just, as the tribunal admitted. The case is strong as the tribunal recognised after a careful examination of the minimum rates in a large range of trades and industries. The union cannot agree to let it stand over indefinitely. The public must, therefore, be prepared for serious trouble if the railway companies maintain their present attitude. This is not a threat but a warning."

Railway and Other Reports

Assam Railways & Trading Co. Ltd.—Approximate figures of the railway and colliery business of this company for the year ended March 31, 1939, in comparison with figures for the year 1937-38 have been published. General traffic receipts for 1938-39 were Rs. 13,54,055, against Rs. 12,68,889; coal traffic receipts for 1938-39, Rs. 6,70,273, against Rs. 6,99,411, making total traffic earnings of Rs. 20,24,328, against Rs. 19,68,300 for 1937-38. Colliery output rose from 229,532 tons to 239,437 tons, and colliery sales from 218,470 tons to 236,933 tons. The interim dividends on the pre-preference 8 per cent. "A" shares and on the new 6 per cent. preference shares have been paid on the usual dates.

Sorocabana Railway Company.—The advisory committee announces that the sterling funds available for distribution on account of the coupon due April 1, 1939, on the 4½ per cent. first debentures (now 5½ per cent. cumulative income first debentures), after taking into account the £323 carried forward on October 1, 1938, amount to £2,055 and are not sufficient to make a payment of one quarter per cent. on the £1,425,940 first debentures outstanding. In these circumstances the advisory committee is compelled to postpone the consideration of any distribution in respect of Coupon No. 55 due on April 1, 1939, on the first debentures, and is carrying forward £2,055 to the credit of the debenture holders. The interest for the half-year ended December 31, 1938, amounting to 892 contos, due on the company's holding of 6 per cent. apolices of the State of São Paulo, and the dividend for the same half-year, amounting to 180 contos, on the company's holding of shares in the Companhia Paulista de Estradas de Ferro, have been paid in Brazilian currency, but owing to the Brazilian exchange restrictions it has not been possible to remit these amounts to London.

Canadian National Steamships Limited.—For the year 1938 there was an operating profit of $746,239, an increase of $87,702 over the previous year. Freight revenues increased by $147,578.

Coventry Machine Tool Works Limited.—Net profit for the year 1938 amounted to £7,577 (against £14,390), to which has to be added £2,143 brought in. Appropriations are made of £2,500 to income tax and N.D.C., and of £1,000 to development reserve. The dividend recommended for 1938 is 5 per cent., comparing with 8 per cent. for 1937, leaving £2,595 to be carried forward. In spite of the increased output during the year, the rising cost of materials and labour, combined with increased taxation, brought about a reduction in the margin of profit.

Forthcoming Meetings

April 25 (*Tues.*).—**San Paulo (Brazilian) Railway Co. Ltd.** (Ordinary General), Southern House, Cannon Street, E.C., at 12.30 p.m.

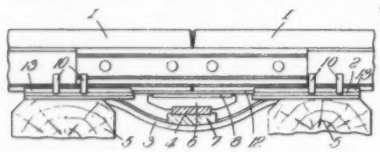
XUM

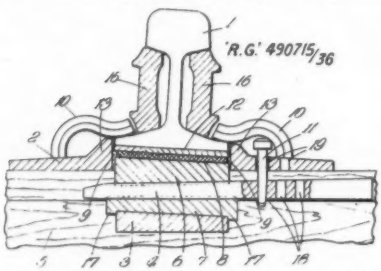
ABSTRACTS OF RECENT PATENTS*

490,715. Rail Joint Connection

L. N. Rawes, of 117, *Fenchurch Street, London, E.C.3.*—(*Convention date : August* 8, 1936.)

A rail joint comprises a plate 2 resting on adjacent sleepers 5 and having





a depending portion 3 between which and the rail bases an adjustable wedge assembly 4, 6, 7 is carried. When the rail ends have been adjusted to the correct level by driving the wedge 4 between the wedges 6, 7, a locking pin 11 is inserted through one of a series of holes 19 in the plate 2, and one of a series of holes 18 in the wedge 4. A pad of rubber 8 and a layer of wood 12 are arranged between the rail base and the wedge 6, and the rails are secured by spring spikes 10 and fish-plates 16.—(*Accepted August* 19, 1938.)

489,073. Railway Vehicle Undercarriage: Dash Pots

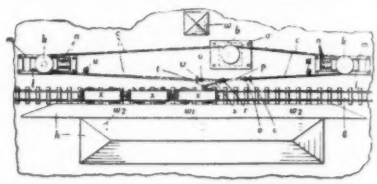
E. Bugatti, of Molsheim, Bas-Rhin Department, France. (*Convention date : August* 24, 1936.)

In a railway vehicle bogie of the kind in which two side frames are flexibly connected to a transverse frame member, resilient means are incorporated in the frame tending to maintain the members in a normal, non-distorted position. In the construction shown in Fig. 1, a tubular transverse member 1 is fitted at its ends with arms 44 carrying pins 45 which engage within resilient sleeves 46 of rubber or like material inserted in apertures in the side frames 2. The vehicle body may be supported on side bearings at the mid-points of the frame 2, while the member 1 may have a central aperture to receive the king-pin, the movements of which may be additionally controlled by a dash pot incorporated in the member 1. Thus, as shown in Figs. 2 and 3, the cylinder 1 is formed with integral upper and lower flanges 3 providing flat surfaces, on the upper of which are disposed two side bearings including seats 4, slides 5, rollers 36, and convex curved plates 6. The king-pin 21 passes into the interior of the cylinder 1 and is provided at its lower end with a ball 19 co-operating with a divided thrust sleeve 20 and an hydraulic dash-pot. Built into the cylindrical portion of the member 1 is a pair of cylinders 11, 12, which are provided respectively with apertured pistons 22, 23 co-operating with fixed rods 28 of variable cross-section, the inner ends of the cylinders 11, 12 being interconnected by pipes 33 and a reservoir 34. The piston rods 24, 25 are directly actuated by the ball 19, which between the sleeve elements 20 and the cylinders 11, 12 are disposed springs 17, 18 each contained within a pair of cages 13, 14 and 15, 16 capable of relative movement. If, for any reason, the body tends to move, say, to the left, relative to the truck frame, the piston 22 will be displaced in the cylinder 11 against an increasing resistance, while the piston 23 will move with comparative freedom, the entrance of the piston rod 24 into the cylinder 11 effecting a transfer of fluid *via* pipe 33 to the cylinder 12. At the same time the spring 17 is compressed and subsequently assists in restoring the parts to a central position. The pistons 22, 23 may be fitted with relief valves 26, while the resistance of the shock-absorbing cylinders may be adjusted by altering the position of the rods 28. —(*Accepted July* 19, 1938.)

490,076. Rope Railways

W. A. Stanier, Chief Mechanical Engineer, London Midland & Scottish Railway Company, Euston station, London, N.W.1, and W. A. Lyall, of the Chief Mechanical Engineers' Department, London Midland & Scottish Railway Company, Euston station, aforesaid. (*Application date*: *April* 5, 1937.)

Apparatus for hauling wagons *x* along a loading platform *h* comprises an endless flexible cable, &c., *c* placed to one side of the track and passing



round one or more tension pulleys *k* and lapped round a capstan or bollard *b* rotated by a motor controlled from one or more positions *w* or w^1, w^2. The cable is connected by a chain *s* and a hook *t* to the wagons. In another form, the capstan replaces one of the pulleys. —(*Accepted August* 9, 1938.)

490,944. Axleboxes for Railway Vehicles

A. W. Maley, of 4, *Grosvenor Road, Handsworth, Birmingham, and E. M. Taunton, of* 90, *Fitzroy Avenue, Harbone, Birmingham.*—(*Application date : February* 24, 1937.)

In an arrangement for permitting a limited lateral movement of a railway vehicle axle 1 relative to the axlebox 3, and of the kind in which restoring springs are interposed between the axlebox and a thrust bearing 5, the springs 8, either in the form of stiff radial laminated springs or of concentric rings, are clamped at their

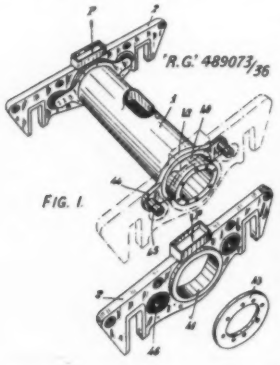


FIG. 1.

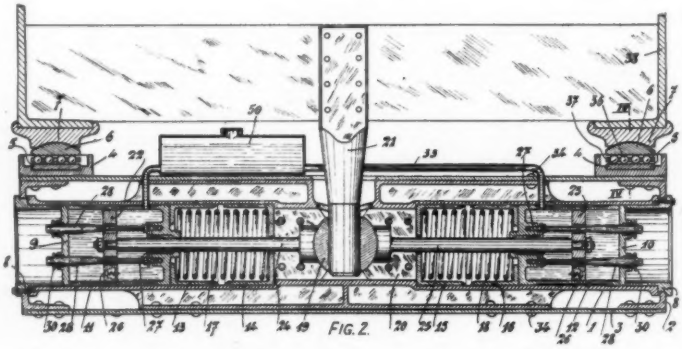


FIG. 2.

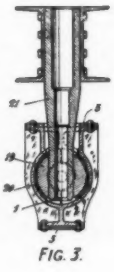
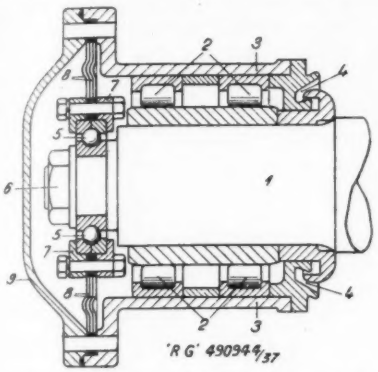


FIG. 3.

* These abridgments of recently published specifications are specially compiled for THE RAILWAY GAZETTE by permission of the Controller of His Majesty's Stationery Office. Group abridgments can be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, either sheet by sheet as issued, on payment of a subscription of 5s. a group volume, or in bound volumes, price 2s. each, and the full specifications can be obtained from the same address price 1s. each

outer ends to the axlebox 3 and at their inner ends to the outer non-rotating race 5′ of the thrust bearing. As shown the axle 1 is supported in the axlebox on roller bearings 2, and is provided on reduced portions of its ends with ball thrust bearings, the

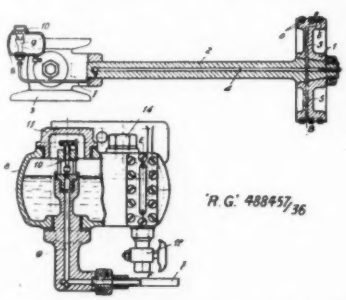


outer races of which are secured by bolts 7′ passing through the springs 8 and through the two portions 7 of a clamping ring. Specification 354,486 is referred to.—(*Accepted August* 24, 1938.)

488,457. Steam Locomotive Lubrication Systems

G. Baillot, of Embourg by Chêneé, Belgium. (*Convention date: August* 13, 1936.)

A steam engine piston is lubricated by a lubricator 8 acting by condensation of steam and connected to a space

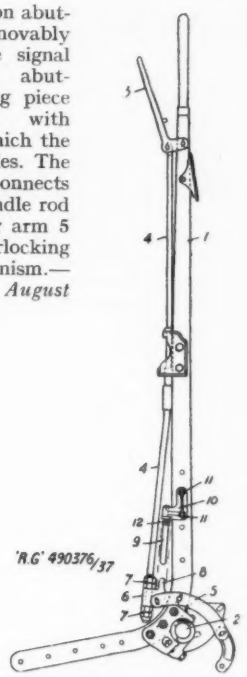


between the piston rings by channels 4, 5. The lubricator is carried by the piston rod and comprises an oil container into which the discharge pipe 9 projects. The inlet orifice of the pipe is controlled by an adjustable valve 10 and is arranged at the level of oil in the lubricator, which level is maintained by condensed steam entering through pipe 9.—(*Accepted July* 7, 1938.)

490,376. Railway Signal Levers

A. G. Kershaw and Westinghouse Brake & Signal Co. Ltd., both of 82, *York Road, King's Cross, London, N.*1.—(*Application date: February* 12, 1937.)

The spring 12 acting on the catch-handle rod 4 of a signal or points lever 1 is off-set from the rod and has one end acting on a lug piece 6 adjustably secured on the rod 4 while the other end engages on abutment 10 removably fixed on the signal lever. The abutment and lug piece are formed with studs 9, 8 which the spring encircles. The lug piece 6 connects the catch handle rod to the rocker arm 5 of the interlocking tappet mechanism.—(*Accepted August* 12, 1938.)



COMPLETE SPECIFICATIONS ACCEPTED

483,790. Lentz, H. J. Valve gear for piston steam engines for locomotives and the like.

484,240. Hayllar, H. F. Joint for railway rails and the like.

485,364. Schweizerische Lokomotive- & Maschinenfabrik. Radial bogies for rail vehicles, comprising one or more axles.

485,906. General Motors Corporation. Bearings for the axle journals of railway and like vehicles.

485,915. Zavody Ringhoffer-Tatra Ackciova Spolecnost. Rail motor vehicles.

485,972. Krupp, A.G., F. Method of and apparatus for condensing vapours, in particular the exhaust steam of locomotives, particularly turbine locomotives.

486,022. Peter, L. H., Shipp, D.G., and Westinghouse Brake & Signal Co. Ltd. Alternating current track circuit signalling systems for railways and the like.

486,044. Sandberg, C. P., and Sandberg, O.F.A. Manufacture of railway and tramway rails.

486,076. Lodetti, A., Negrini, B., and Sbarberi, A. Connecting means for railway and tramway rails.

486,145. Schweizerische Lokomotive- & Maschinenfabrik. Universally movable power transmissions for rail-guided vehicles with axles individually driven by a motor.

486,226. Wagner, F. (trading as Wagner & Co., F.). Device for controlling the flow of wet steam from locomotive boilers.

486,361. General Railway Signal Co. Ltd. Systems for the remote control of railway track switches and signals.

486,650. Symington-Gould Corporation. Friction units for bolster spring arrangements in railway trucks.

487,244. Kershaw, A. G., Simmonds, A. W., and Westinghouse Brake & Signal Co. Ltd. Driver's brake valve devices for fluid-pressure braking apparatus.

487,331. Eichelgrun, M. Axleboxes for light railways.

487,438. Graff-Baker, W. S. and London Passenger Transport Board. Ventilators for railway coaches and other vehicles.

487,461. Svenska Aktiebolaget Broms-Regulator. Automatic slack-adjusters for vehicle brakes, especially railway car brakes.

487,511. Toy-Midgley, J. C. Railway permanent way.

487,617. Graff-Baker, W. S. and London Passenger Transport Board. Bogies for railway and like vehicles.

488,240. General Railway Signal Co. Ltd. Railway track circuits.

488,457. Baillot, G. Lubrication systems for steam engines, locomotives, and the like.

488,724. Vereinigte Eisenbahn-Signal-Werke Ges. Signalling systems for giving signal indications on trains controlled magnetically from the track, and *vice versa*.

488,776. Strunk, G. Haulage and buffering apparatus for trucks or cars on railways.

489,073. Bugatti, E. Frames for railway vehicle trucks.

489,085. Labilliere, F. C. D. de, and MacLaverty. Apparatus for ventilating railroad vehicles.

489,138. General Railway Signal Co. Ltd. Train describer systems for railways.

489,472. Castin, M., and Hassel, P. Van. Railroad vehicles.

489,585. Kingsman, H. E. Scaffolding or tubular supports for gravity railways and other purposes.

489,861. MacGregor, R. M., and Westinghouse Brake Signal Co. Ltd. Light signals for railways and the like.

490,076. Stanier, W. A., and Lyall, W. A. Cable haulage appliances for moving railway vehicles.

490,320. Eisenwerk Wanheim Ges. Hydraulically controlled track brakes, more especially for railways.

490,326. Tyer & Co. Ltd., King, V. S., and Roberts, C. G. Releasing mechanism for controlling the movement of railway signal and/or points levers or the like.

490,376. Kershaw, A. G., and Westinghouse Brake & Signal Co. Ltd. Point or signal-operating levers for railways and the like.

490,623. Baldwin, R., and Davies, T. L. Ventilator for rail vehicles.

490,715. Rawes, L. N. Railway rail-joint connections.

490,944. Maley, A. W., and Taunton, E. M. Axlebox constructions for rail vehicles.

490,996. Maley, A. W., and Taunton, E. M. Operating-mechanism for railway and like points.

491,159. Superheater Co. Ltd. (Superheater Co.). Steam superheaters for locomotive and similar smoke-tube boilers.

491,629. Pilz, W. Grinding of railway wheels.

491,698. Budd Manufacturing Company, E. G. Railcars.

491,922. Sandberg, C. P., and Sandberg, O. F. A. Manufacture of railway tyres and solid wheels.

492,130. Summerson & Sons Ltd., T., and Wrightson, S. S. Hand-controlled switch boxes for railways.

492,249. Zavody Ringhoffer - Tatra Akciova Spolecnost. Railmotor vehicles.

492,301. Westinghouse Brake & Signal Co. Ltd. Electric interlocking systems for railway signalling apparatus.

XUM

NOTES AND NEWS

Summer Time.—The introduction of summer time on Sunday last affected over 16,000 clocks on the L.M.S.R., including 200 synchronised clocks at Euston.

Lullingstone New Station.—The date of opening of Lullingstone, the new Southern Railway station between Swanley and Eynsford, has been postponed.

Tournai-Jurbise and Landen-Hasselt Railways.—The liquidators of the Société Anonyme des Chemins de fer de Tournai à Jurbise et de Landen à Hasselt announce that the general meeting of the company will be held at 11 a.m. on Wednesday, April 26, at 19, Rue des Cultes, Brussels, to consider the report of the liquidators, and the situation as at March 14 last.

Dacca Mail in Collision.—In the early morning of April 17 the down mail from Dacca to Sealdak (Calcutta) came into collision with an express which was standing at Majdia station, about 66 miles from Calcutta, on the Eastern Bengal Railway main line. Reports as to the number of casualties vary, but, apparently, about 35 were killed and 31 injured.

Reserved Seat Excursion Trains on the L.M.S.R.—The L.M.S.R. is to make the experiment during the Glasgow Fair period in July of running reserved seat excursion trains from Glasgow to such centres as Aberdeen, Blackpool, and Morecambe, in an endeavour to solve the problem of coping with the great crowds leaving Glasgow at this time. Another innovation will be the provision of guides at the L.M.S.R. Glasgow termini to help passengers find their reserved seats.

Midland Uruguay Railway Debenture Plan.—Holders of the 5 per cent. debenture stock in the Midland Uruguay Extension Railway Company at a meeting on April 4 approved a reduction in the rate of interest from 5 per cent. to 3 per cent. for two years, conditional upon the holders of 5 per cent. prior lien debenture stock in the Midland Uruguay Railway Company authorising, at the adjourned meeting to be held on April 25, a temporary release from the sinking fund. This relief is asked for by the directors in order that the parent company may undertake an extensive sleeper renewal programme.

Indian State Railways Dinner.—The annual Indian State Railways dinner will be held at the Café Monico, Piccadilly Circus, at 7 p.m. for 7.30, on Monday, May 22. Mr. J. C. Highet, Member of the Railway Board and former Agent of the North Western Railway, has been invited to preside. Evening dress, decorations and miniatures. Tickets price 12s. 6d., including all tips, may be obtained from: Mr. N. D. Calder (Hon. Sec.), East India and Sports Club, St. James's Square, S.W.1; or, The Manager, Indian Railways Publicity Bureau, 57, Haymarket, S.W.1.

More 120-ft. Rails on the L.N.E.R.—Rails rolled in 120-ft. lengths at the Newton works of the Steel Company of Scotland have recently been delivered at Reston for relaying on the main line of the L.N.E.R. Rails of the same length are shortly to be laid on the Tay bridge.

Return from America.—In the abstract translation of M. Marcel Bloch's article, "Return from America," published in THE RAILWAY GAZETTE for April 7, the firegrate area and the boiler pressure of the 2-8-8-2 Mallet locomotives of the Norfolk & Western Railway were incorrectly given. These figures should have been 105 sq. ft. and 234 lb. per sq. in. respectively.

Rail and Admission Tickets to Zoo.—Intending visitors to the Zoological Park at Edinburgh can now obtain at L.N.E.R. stations tickets to cover the return rail journey to Edinburgh (Waverley) or Pinkhill and admission to the zoo. These tickets, which were introduced on April 1, are issued from a wide range of stations on the days on which cheap tickets are normally issued into Edinburgh, and on Sundays where the train service permits.

Railway Students' Association—Presidential Address by Mr. Ashton Davies.—Mr. Ashton Davies, Acting Vice President, London Midland & Scottish Railway, has now recovered from his prolonged illness, and has agreed to deliver his presidential address to the Railway Students' Association on Thursday, April 27. The meeting will be held in the old lecture theatre of the London School of Economics at 6.15 p.m. It is expected that Mr. Ashton Davies will deal in his paper with the railway companies claim for a "square deal."

Presentation to Mr. E. E. Painter.—On April 19 Mr. Ashton Davies, on behalf of the railway officers, made a presentation to Mr. E. E. Painter, formerly Secretary of the Railway Clearing House, of a grandfather clock and a cheque, also a handbag for Mrs. Painter. Mr. Painter's retirement on March 31 was recorded in our issue of that date. The function took place in the Board Room of the Railway Clearing House and was attended by officers of almost all departments of the railways. Mr. F. R. Potter (Chairman of the Traffic Officers' Joint Conference) and Mr. C. J. Selway, Senior Member of the conference, expressed on behalf of the officers their appreciation of Mr. Painter's unfailing tact and courtesy, and Mr. Ashton Davies referred in some detail to the main features of Mr. Painter's long service of nearly 50 years with the Railway Clearing House. Mr. Painter, in reply, thanked the railway officers for their generous present, and coupled with it his appreciation of the unfailing consideration he had always received. He concluded by expressing his hopes for the prosperity of the railways in the future, and asked all present to accept his good wishes for the coming days.

Rhondda Tramways Electric Supply Co. Ltd.—It is announced in the report for 1938 of this company (controlled by Rhondda Transport Co. Ltd.) that an extraordinary meeting has been called for April 27, at 88, Kingsway, to consider a resolution for voluntary liquidation.

Canadian Pacific Earnings.—Gross earnings of the Canadian Pacific Railway for the month of February, 1939, amounted to $9,196,000, a decrease of $187,000 in comparison with February, 1938. Working expenses were $8,963,000 or $96,000 lower, leaving net earnings $91,000 lower, at $233,000. For the first two months of 1939 gross earnings were $18,895,000, a decrease of $803,000 in comparison with the first two months of 1938, and the net earnings of $694,000 showed a fall of $187,000.

Canadian National Earnings.—The February, 1939, gross earnings of the Canadian National Railways were $13,069,775, a decrease of $219,946 in comparison with February, 1938. Operating expenses amounted to $14,357,117, with a decrease of $279,823, resulting in a deficit on working of $1,287,342, which is $59,877 less than that for February, 1938. Aggregate gross earnings for the first two months of 1939 amounted to $26,564,780, a decrease of $46,573 in comparison with the first two months of 1938, and the deficit on working was $1,895,538, or $962,435 lower.

New London Transport Posters.—The London Passenger Transport Board with its seasonal appositeness has lately brought out two posters symbolic of the germinal season. One of them bears an invitation to the Londoner to follow the lead of the daffodils which form its floral design—"The daffodils are out—what about you?" An apt quotation from Shakespeare completes the poster. The other poster, which reminds the Londoner that the board's summer services began at Easter, has also a floral design.

Railways and the London Building Acts.—Arguments were put before Lord Merthyr's Committee of the House of Lords on March 28 in reference to the position of the main-line railway companies, the London Passenger Transport Board, and the Port of London Authority under the London Building Acts. The committee has before it a Bill to amend those Acts. Mr. Maurice Fitzgerald, K.C., for the railway companies, argued that all buildings on railway property should continue to be exempt from the building by-laws. Railway companies were responsible people with statutory obligations to the public and to put them under the control of people who had not a tithe of their knowledge would have the effect of hampering their work. Mr. Craig Henderson, K.C.,

for the L.C.C., said that there was no wish to interfere with railway traffic, but only to see that proper control was exercised over buildings not strictly used for traffic purposes. On March 29 Lord Merthyr's Committee decided that buildings and structures on a railway or within a railway station occupied and used by the railway company should be exempt from the L.C.C. by-laws, but that buildings above an underground or tube railway which were outside the precincts of a station should not be exempt. It was also decided that buildings on dock premises belonging to the Port of London Authority should retain their present exemption from the by-laws.

Landslide on S.R. London-Dover Line.—The main line of the Southern Railway from London to Dover was blocked by a landslide which occurred in the cutting south of Sevenoaks tunnel on April 13. Falls of earth began shortly before noon and blocked the up line, but the digging-out operations necessitated closing the down line as well and diverting trains *via* Oxted and Maidstone East, or, in the case of boat trains, *via* Chatham and Maidstone East. Special bus services for local passengers were instituted between Tonbridge, Hildenborough, and Sevenoaks. The earth continued to slip as that obstructing the line was removed, so that the down line could not be re-opened till the afternoon of Monday, April 17. Normal traffic on both lines was restored at 6 a.m. the next day.

Road Accidents.—The Ministry of Transport return for March of persons killed or injured in road accidents is as below. The figures in brackets are those for the corresponding period of last year :—

	Killed	Injured
England—		
Pedestrians ...	197 (221)	5,054 (5,350)
Others... ...	198 (226)	8,583 (9,694)
Wales—		
Pedestrians ...	12 (10)	189 (206)
Others... ...	4 (12)	304 (324)
Scotland—		
Pedestrians ...	27 (34)	599 (671)
Others... ...	19 (13)	664 (692)
	457 (516)	15,393(16,937)

The total fatalities for the preceding month were 462, compared with 462 in the corresponding period of last year.

British and Irish Traffic Returns

GREAT BRITAIN	Totals for 15th Week			Totals to Date		
	1939	1938	Inc. or Dec.	1939	1938	Inc. or Dec.
L.M.S.R. (6,831¼ mls.)	£	£	£	£	£	£
Passenger-train traffic...	484,000	700,000	– 216,000	6,211,000	6,318,000	– 107,000
Merchandise, &c. ...	436,000	416,000	+ 20,000	6,601,000	7,256,000	– 655,000
Coal and coke ...	213,000	220,000	– 7,000	4,393,000	4,344,000	+ 49,000
Goods-train traffic ...	649,000	636,000	+ 13,000	10,994,000	11,600,000	– 606,000
Total receipts	1,133,000	1,336,000	– 203,000	17,205,000	17,918,000	– 713,000
L.N.E.R. (6,320 mls.)						
Passenger-train traffic...	328,000	418,000	– 90,000	4,088,000	4,135,000	– 47,000
Merchandise, &c. ...	311,000	281,000	+ 30,000	4,605,000	5,132,000	– 527,000
Coal and coke ...	227,000	192,000	+ 35,000	3,892,000	4,006,000	– 114,000
Goods-train traffic ...	538,000	473,000	+ 65,000	8,497,000	9,138,000	– 641,000
Total receipts	866,000	891,000	– 25,000	12,585,000	13,273,000	– 688,000
G.W.R. (3,737¾ mls.)						
Passenger-train traffic...	205,000	289,000	– 84,000	2,629,000	2,634,000	– 5,000
Merchandise, &c. ...	168,000	163,000	+ 5,000	2,796,000	2,956,000	– 160,000
Coal and coke ...	91,000	98,000	– 7,000	1,721,000	1,830,000	– 109,000
Goods-train traffic ...	259,000	261,000	– 2,000	4,517,000	4,786,000	– 269,000
Total receipts	464,000	550,000	– 86,000	7,146,000	7,420,000	– 274,000
S.R. (2,140 mls.)						
Passenger-train traffic...	321,000	429,000	– 108,000	4,145,000	4,142,000	+ 3,000
Merchandise, &c. ...	53,500	53,500	—	845,000	908,000	– 63,000
Coal and coke ...	26,500	23,500	+ 3,000	526,000	529,000	– 3,000
Goods-train traffic ...	80,000	77,000	+ 3,000	1,371,000	1,437,000	– 66,000
Total receipts	401,000	506,000	– 105,000	5,516,000	5,579,000	– 63,000
Liverpool Overhead ... (6½ mls.)	1,367	1,201	+ 166	19,529	19,776	– 247
Mersey (4½ mls.) ...	4,895	4,510	+ 385	67,616	65,914	+ 1,702
*London Passenger Transport Board ...	612,000	554,200	+ 57,800	23,820,000	23,594,100	+ 225,900
IRELAND						
Belfast & C.D. pass. (80 mls.)	3,800	1,898	+ 1,902	27,294	25,252	+ 2,042
,, ,, goods	348	484	– 136	6,449	6,637	– 188
,, ,, total	4,148	2,382	+ 1,766	33,743	31,889	+ 1,854
Great Northern pass. (543 mls.)	14,200	10,650	+ 3,550	131,550	122,600	+ 8,950
,, ,, goods	8,450	8,600	– 150	145,650	131,850	+ 13,800
,, ,, total	22,650	19,250	+ 3,400	277,200	254,450	+ 22,750
Great Southern pass. (2,076 mls.)	41,543	35,350	+ 6,193	440,005	430,214	+ 9,791
,, ,, goods	34,899	40,021	– 5,122	602,301	609,374	– 7,073
,, ,, total	76,442	75,371	+ 1,071	1,042,306	1,039,588	+ 2,718

* 42nd week (before pooling) Good Friday, 1938 Easter Monday, 1939

British and Irish Railway Stocks and Shares

Stocks	Highest 1938	Lowest 1938	Prices April 19, 1939	Prices Rise/Fall
G.W.R.				
Cons. Ord. ...	65¼	25¾	25	–1
5% Con. Prefce....	118¾	74	76	–1
5% Red.Pref.(1950)	111¾	90	89	–1
4% Deb.	111	97½	93	–1
4½% Deb.... ...	112 5/16	100½	95	–3
4½% Deb.... ...	118½	104	102½	–2½
5% Deb.	131½	119	113½	–2
2½% Deb.... ...	69¾	60	60½	—
5% Rt. Charge ...	129	114	107½	—
5% Cons. Guar. ...	128½	103	100	–1
L.M.S.R.				
Ord.	30½	11	12¾	–½
4% Prefce. (1923)	70¼	23	28½	–1
4% Prefce. ...	82¼	43¾	47½	–1
5% Red.Pref.(1955)	103½	66	69½	–2
4% Deb.	105 13/16	85	89	—
5% Red.Deb.(1952)	114¼	105	107½	—
4% Guar. ...	102¾	77½	77	—
L.N.E.R.				
5% Pref. Ord. ...	8 9/16	3½	4	—
Def. Ord.	4 7/16	2 1/16	2	–1/8
4% First Prefce.	68¼	21	24½	–1
4% Second Prefce.	27¼	8	10	—
5% Red.Pref.(1955)	97	40¼	46½	–1
4% First Guar. ...	97½	66¼	67	–1
4% Second Guar.	91¼	52	51	–1
3% Deb.	79¼	60	61	–2
4% Deb.	104 1/8	77	82	–2
5% Red.Deb.(1947)	110 5/8	97	102½	—
4½% Sinking Fund Red. Deb.	108 11/16	101	100	—
SOUTHERN				
Pref. Ord. ...	87	47⅞	62	—
Def. Ord. ...	21¾	9¼	13	–¼
5% Pref.	115	83	87	–2
5% Red.Pref.(1964)	115⅛	98	95½	—
5% Guar. Prefce.	128½	106	106	—
5% Red.Guar.Pref. (1957)	116	109½	106½	–1½
4% Deb.	109¼	95	93½	—
5% Deb.	129	117	112½	—
4% Red. Deb. 1962-67	107	101½	101½	—
BELFAST & C.D.				
Ord.	4	3½	4	—
FORTH BRIDGE				
4% Deb.	102	99⅛	96½	—
4% Guar. ...	103¼	94½	94	—
G. NORTHERN (IRELAND)				
Ord.	5½	2½	3½	—
G. SOUTHERN (IRELAND)				
Ord.	25½	8½	10	—
Prefce.	35	13	12¼	—
Guar.	70¼	30 13/32	26	–4½
Deb.	83	56	48	–3½
L.P.T.B.				
4½% "A" ...	119⅝	107½	107	–3
5% "A" ...	130	117	115½	–2
4½% "T.F.A." ...	108	98	101½	–2
5% "B" ...	122 13/16	105	107	–3
"C"	84	68	65½	–3
MERSEY				
Ord.	24¼	16½	20½	–½
4% Perp. Deb. ...	102⅞	94¾	94½	—
3% Perp. Deb. ..	77	69	66½	—
3% Perp. Prefce.	66½	57	55	—

XUM

LEGAL AND OFFICIAL NOTICES

In the Court of the Railway Rates Tribunal.

Road and Rail Traffic Act, 1933.

Agreed Charges.

NOTICE IS HEREBY GIVEN that Applications for the approval of Agreed Charges under the provisions of Section 37 of the Road and Rail Traffic Act, 1933, short particulars of which are set out in the Schedule hereto, have been lodged with the Railway Rates Tribunal.

The Procedure to be followed in regard to the inspection of the said Applications and the filing of Notices of Objections is that published in the *London Gazette* of 28th July, 1936.

Printed copies of the Procedure can be obtained from the Railway Rates Tribunal, Bush House, Aldwych, London, W.C.2.

Notices of Objection to any of the said Applications must be filed on or before the 5th May, 1939.

A copy of each Application can be obtained from Mr. G. Cole Deacon, Secretary, Rates and Charges Committee, Fielden House, Great College Street, Westminster, London, S.W.1, price 1s. post free.

T. J. D. ATKINSON,
Registrar.

12th April, 1939.

Number of Application	Name of Trader and General Description of Traffic
1939	
No. 188	J. W. SPEAR & SONS LTD., 10–12, Milton Street, London, E.C.2; Cardboard Games, Toys.
No. 189	THE ELEPHANT CHEMICAL CO. LTD., 171–3, Neate Street, London, S.E.5; Chemicals, etc.
No. 190	WALTER GREGORY & CO. LTD., Wellington, Somerset; Cattle Medicines, etc.
No. 191	JOHN WHITE & CO. (BRISTOL) LTD., 107–108, Thomas Street, Bristol, 1; Bacon, Ham, Butter, etc.
No. 192	THE EXCELSIOR MOTOR CO. LTD., Tyseley, Birmingham; Motor Bicycles, "Autobyks."
No. 193	ASTIN BROS. LTD., Hebden Bridge; Clothing.
No. 194	F. & T. LUMB LIMITED, Fairfield, Hebden Bridge, Yorks; Day-old Chicks, Poultry, etc.
No. 195	WM. O'HANLON & CO. LTD., 49 and 51, Dale Street, Manchester; Cotton and Linen Goods, etc.
No. 196	ALFRED POLIKOFF (WALES) LIMITED, Ynyswen, Treorchy; Clothing.
No. 197	G. T. CULPITT & SON LTD., Southgate Grove, Islington, London, N.1; Cake Ornaments, etc.
No. 198	DAVIES BOTTLED FRUITS LIMITED, Bank Buildings, 16, St. James's Street, London, S.W.1; Bottled and Canned Fruits, etc.
No. 199	RAPIDO PADDING & CURLED HAIR MANUFACTURERS LIMITED, Angel Road, Edmonton, London, N.18; Hair and Fibre Paddings, etc.
No. 200	MANBRE & GARTON LIMITED, Winslow Road, Hammersmith, London, W.6; Returned Empties.
No. 202	THE BEAR HONEY CO. LTD., Garvin House, Twickenham Road, Isleworth, Middlesex; Honey, etc.
No. 203	CARIBONUM LIMITED, Laura Road, Leyton, London, E.10; Carbon Paper, Typewriter Ribbons, etc.
No. 204	DOMINION DAIRY CO. LTD., Aylesbury, Bucks; Butter, Cheese, etc.
No. 205	GUARD BRIDGE PAPER CO. LTD., Guard Bridge, Fife; Paper, etc.
No. 206	SAUL D. HARRISON & SONS, Stronghold Works, Abbey Road, Stratford, London, E.15; Rags, Flocks, Fibres, etc.
No. 207	KINGSLEY (ART FURNITURE) LIMITED, 20, Devonshire Street, Bridgwater, Somerset; Wicker Furniture, etc. *(Applicable also to traffic consigned by one Associated or Subsidiary Company.)*
No. 208	NORVIC SHOE CO. LTD., St. George's Plain, Norwich; Leather, Boots, Shoes, etc. *(Applicable to traffic consigned by two Associated or Subsidiary Companies.)*
No. 209	SHIELDS ICE & COLD STORAGE CO. LTD., North Shields; Preserves, etc., ex Didcot.
No. 210	WALL PAPER MANUFACTURERS LIMITED, 125, High Holborn, London, W.C.1; Paper Hangings. *(Applicable also to traffic consigned by five Associated or Subsidiary Companies.)*
No. 211	JAS. R. WATSON & CO., Cornwall Buildings, 35, Queen Victoria Street, London, E.C.4; Cartridges, Firearms and Ammunition, etc. *(Applicable also to traffic consigned by one Associated or Subsidiary Company.)*
No. 212	WINSOME DAIRY PRODUCTS LIMITED, 42a, Bravington Road, London, W.9; Cheese.
No. 213	WINTERBOTTOM BOOK CLOTH CO. LTD., 12, Newton Street, Manchester; Book Cloth and Tracing Cloth.
No. 214	THE CITY & PROVINCIAL STORES LIMITED, Atlantic Mills, Droylsden Road, Newton Heath, Manchester, 10; Furniture and Household Requisites. *(Applicable also to traffic consigned by two Associated or Subsidiary Companies.)*
No. 215	J. ENGLISH & CO. LTD., 8, Lloyd's Avenue, London, E.C.3; Disinfecting Fluids, etc. *(Applicable also to traffic consigned by one Associated or Subsidiary Company.)*
No. 216	FOWLER BROS. LTD., 40, St. Martin's-le-Grand, London, E.C.1; Confectionery, etc.
No. 217	THE GRAMOPHONE CO. LTD., Hayes, Middlesex; Wireless Apparatus, Gramophones, etc. *(Applicable also to traffic consigned by three Associated or Subsidiary Companies.)*
No. 218	H. J. HEINZ CO. LTD., Harlesden, London, N.W.10; Groceries, Preserves, Provisions, etc., ex Southampton.
No. 219	EDWARD HILL & SONS LTD., Regina Works, Lye, near Stourbridge; Hollow-ware.
No. 220	THE NATURAL FOOD CO. LTD., 210, 212 and 214, Cambridge Road, London, E.2; "Allinson Flour," etc., ex Newport.
No. 221	PREMIER YEAST CO. LTD., Long Drive, Greenford, Middlesex; Yeast, etc.
No. 222	SHEET IRON WORKERS LIMITED, Phœnix Works, Cradley, near Cradley Heath, Staffs; Telegraph Stay Rods and Brackets, etc.
No. 223	THE "SUN" CYCLE & FITTINGS CO. LTD., Aston Brook Street, Birmingham, 6; Bicycles, etc.
No. 224	WITHINS PAPER STAINING COMPANY, Bury Road, Radcliffe; Paper Hangings.
No. 225	MARMET LIMITED, Letchworth, Herts; Perambulators, etc. *(Applicable also to traffic consigned by one Associated or Subsidiary Company.)*
No. 226	RAYNER & CO. LTD., Commercial Road, Edmonton, N.18; Confectionery, etc.
1939	
No. 227	ROLLS & CO. LTD., College Gardens, Silver Street, Upper Edmonton, London, N.18; Distemper, etc.
No. 228	THE ABIETSAN MANUFACTURING CO. LTD., Carmichael Road South Norwood, London, S.E.25; Perfumery, etc.
No. 229	GEO. T. COX & SONS LTD., 31, King William Street, London, E.C.4; Groceries, Preserves, Provisions, etc.
No. 230	LEA & PERRINS LIMITED, Midland Road, Worcester; Sauces, etc.
No. 231	HENRY LISTER & SONS LTD., Troydale Mill, Pudsey, Yorks; Cloth (Textiles).
No. 232	A. MACNAIR & CO. LTD., Dolphin Street, Ardwick Green, Manchester, 12; Gum, Spirit Varnish, etc.
No. 233	WIGGINS, TEAPE & ALEX. PIRIE (SALES) LIMITED, 46–58, Mansell Street, Aldgate, London, E.1; Paper, ex Bucksburn.
No. 234	THOMAS WYATT & SON LTD., Burlington Works, Keymer Street, Manchester, 11; Stationery, etc. *(Applicable also to traffic consigned by one Associated or Subsidiary Company.)*
No. 235	DENT, ALLCROFT & CO. LTD., 97, Wood Street, London, E.C.2; Gloves.
No. 236	NORVIC SHOE CO. LTD., St. George's Plain, Norwich; Boots, Shoes, etc. *(Applicable to traffic consigned by two Associated or Subsidiary Companies.)*
No. 237	J. SEARS & CO. (TRUE-FORM BOOT CO.) LTD., Northampton; Boots and Shoes.
No. 238	H. SMETHURST (FISH CURERS) LIMITED, Ropery Street, Grimsby; Cooked Delicacies.
No. 239	THE UNITED CREAMERIES LIMITED, 16A, Princes Square, Buchanan Street, Glasgow; Butter, Cream, etc.
No. 240	CARRICK'S (CATERERS) LIMITED, 47, Grey Street, Newcastle-upon-Tyne, 1; Black Puddings, Cooked Meats, etc.
No. 241	THE FORE STREET WAREHOUSE CO. LTD., 104, Fore Street, London, E.C.2; Drapery, etc.
No. 242	GREENGATE & IRWELL RUBBER CO. LTD., Irwell Works, Ordsall Lane, Salford, Manchester; Waterproof and Showerproof Coats, Rubber Goods, etc.
No. 243	KAYS (MANCHESTER) LIMITED, 57, Dale Street, Manchester; Costumes, etc.
No. 244	MASTERS & CO. (CLOTHIERS) LTD., 28–31, St. Mary Street, Cardiff; Gentlemen's Outfitting.
No. 245	J. W. MYERS LIMITED, Saville Street Works, Saville Street, Leeds 1; Caps and Clothing. *(Applicable also to traffic consigned by one Associated or Subsidiary Company.)*
No. 246	R. TWINING & CO. LTD., 216, Strand, London, W.C.2; Tea, etc.
No. 247	T. WALL & SONS LTD., The Friary, Acton, London, W.3; Sausages, Cooked Meat, etc.
No. 248	WELCH, MARGETSON & CO. LTD., 16, Moor Lane, London, E.C.2; Textiles, etc.
No. 249	NEWBALL & MASON LIMITED, Nottingham; Confectionery, etc.
No. 250	RUDKIN, LAUNDON & CO. LTD., 346, St. Saviour's Road, Leicester; Hosiery, etc.
No. 251	J. SMITH, HARGREAVES & CO. LTD., 8, New Brown Street, Manchester; Towelling and Shirting.
No. 252	WORCESTERSHIRE PACKERS & GROWERS LIMITED, 110, Cannon Street, London, E.C.4; Preserves, etc.
No. 253	THE STANDARD YEAST CO. LTD., Lamb Distillery, Church Street, Chiswick, London, W.4; Yeast and Bakers' Sundries. *(Applicable also to traffic consigned by one Associated or Subsidiary Company.)*
No. 254	BRAITHWAITE'S, 12, Embledon Street, Liverpool; Cooked Meats, etc.
No. 255	THE CELLULAR CLOTHING CO. LTD., 14, Moor Lane, London, E.C.2; Shirts, etc.
No. 256	GRAINGER & SMITH LIMITED, Dudley; Clothing, etc. *(Applicable also to traffic consigned by five Associated or Subsidiary Companies.)*
No. 258	PREMIER SOAP CO. LTD., Stoneferry, Hull; Soap, etc.
No. 259	THE WATFORD BISCUIT CO. LTD., Sandown Road, Watford, Herts; Biscuits, Confectionery, etc.
No. 260	NESTLÉ'S MILK PRODUCTS LIMITED, 6 and 8, Eastcheap, London, E.C.3; Chocolate, Cocoa, Confectionery, etc.
No. 261	J. & I. BATTEN & CO. LTD., Plantation House, Fenchurch Street, London, E.C.3; Tea and Coffee. *(Applicable also to traffic consigned by four Associated or Subsidiary Companies.)*
No. 262	LINGARD'S CLOTHING CO. (B'HAM) LTD., Musgrave Road, Hockley, Birmingham, 18; Clothing.
No. 263	THE BRITISH BROADCASTING CORPORATION, Broadcasting House, Portland Place, London, W.1; Periodicals, etc.
No. 264	J. DARNALL & SON LTD., 76–94, Kingsland Road, London, E.2; Boots and Shoes.
No. 265	R. T. JENNINGS & SON LTD., Marsh Street, Stafford; Boots and Shoes.
No. 266	SOMERVELL BROS. LTD., Kendal; Boots, Shoes, etc.
No. 267	TURNER & SON LTD., Goldsmith Street, Nottingham; Cake.
No. 268	S. DORNBERGER & CO. LTD., Gamage Building, Holborn, London, E.C.1; Glassware, China, etc.
No. 269	CLYDESDALE SUPPLY CO. LTD., 2, Bridge Street, Glasgow, C.5; Electric Batteries, Radio Goods, etc.

Legal and Official Notices—*continued*

Crown Agents for the Colonies

COLONIAL GOVERNMENT APPOINTMENTS

APPLICATIONS from qualified candidates are invited for the following post:—

CHIEF DRAUGHTSMAN (MECHANICAL)

required for the Federated Malay States Railway for three years with possible permanency. Salary $400 a month rising by annual increments of $20 a month to $600 a month (the Government rate of exchange is now 2s. 4d. to the dollar). A children's allowance is payable to married officers with children. Free passages, and if married for wife and children, not exceeding four persons, subject to certain conditions. Liberal leave on full salary. Candidates, not more than 32 years of age, must have served an apprenticeship with a British Railway or firm of Locomotive Builders and have had at least three years' experience in a locomotive or Carriage and Wagon Drawing Office. They must possess a Higher National Certificate in Mechanical Engineering or equivalent qualification.

Apply at once by letter, stating age, whether married or single, and full particulars and experience, and mentioning this paper, to the Crown Agents for the Colonies, 4, Millbank, London, S.W.1, quoting M/5699.

South Indian Railway Company Limited

THE Directors are prepared to receive Tenders for the supply of:—

COPPER PLATES.

Specifications and Forms of Tender will be available at the Company's Offices, 91, Petty France, Westminster, S.W.1.

Tenders addressed to the Chairman and Directors of the South Indian Railway Company Limited, marked "Tender for Copper Plates," with the name of the firm tendering, must be left with the undersigned not later than 10 a.m. on Friday, the 5th May, 1939.

The Directors do not bind themselves to accept the lowest or any Tender.

A charge, which will not be returned, will be made of 10s. for each copy of the Specification.

Copies of the drawings may be obtained at the Offices of the Company's Consulting Engineers, Messrs. Robert White & Partners, 3, Victoria Street, Westminster, S.W.1.

E. A. S. BELL,
Managing Director.

91, Petty France,
Westminster, S.W.1.
18th April, 1939.

CIVIL ENGINEER, age about 25, preferably with some railway experience, required as District Engineer on British owned railway in Nyasaland. Starting salary £400 per annum on three years' contract (renewable), with free living accommodation and passages out and home. Write giving age and full particulars of education, training, qualifications and experience, with copies only of testimonials, to: Box "C.M.," c/o 95, Bishopsgate, London, E.C.2.

Universal Directory of Railway Officials and Railway Year Book

44th Annual Edition, 1938-39

This unique publication gives the names of all the principal railway officers throughout the world, together with essential particulars of the systems with which they are connected. Much general and statistical information about railways is also concisely presented.

Price 20/- net.

THE DIRECTORY PUBLISHING CO. LTD., 33, Tothill Street, Westminster, S.W.1.

CONTRACTS AND TENDERS

New Eastern Underground Terminal, L.P.T.B.

Caffin & Co. Ltd. has received a contract from the London Passenger Transport Board for the engineering work at Hainault, the new Underground terminal station in Essex. The contract is an important step in the extension of the Central Line beyond Liverpool Street, through 9 miles of new tunnel and then over L.N.E.R. electrified tracks, to Stratford, Hainault, Loughton, Epping, and Ongar. Hainault will become an important terminus. The present L.N.E.R. station will be demolished and a new building will take its place. Two further bridges over New North road will be constructed on the west side of the existing bridge to carry an extra running track, and to carry shunting lines to the new depot, which is now finished. Three entrances on New North Road will lead into an elliptical ticket hall under the tracks. The station, which will be of modern design, will contain three shops, public lavatories, a cycle store, public telephones, and a left luggage office. Over the platforms there will be a yardmaster's office, and a trainmen's mess room and locker room. It is expected that tube trains will be running to Hainault by the end of next year.

G. H. Sheffield & Co. (Engineers) Ltd. has received an order for 80 Sheffield–Twinberrow double-frame welded passenger bogies complete with Isothermos axleboxes and wheels and axles for the all-steel third class coaches under construction by Baume & Marpent, Belgium, for the Egyptian State Railways.

A. Foster has received a contract from the London Passenger Transport Board for the reconstruction of steelwork under the Smithfield market, a large part of which is carried over the Metropolitan Line between Farringdon and Aldersgate. Because of the dampness of the air the metal deteriorates rapidly, and the cost of maintenance has been heavy. The new steelwork is being encased in waterproof brickwork. Some 150 tons of new steel are being used, and the work is not being allowed to interrupt railway traffic.

Siemens Electric Lamps & Supplies Limited has received a repeat contract from the L.N.E.R. for twelve months' supply of Siemens' British-made electric lamps.

The Metropolitan-Vickers Electrical Co. Ltd. has received a part contract from the L.N.E.R. for Cosmos electric lamps for a period of twelve months ending April 30, 1940.

The Bengal–Nagpur Railway Administration has placed orders with the North British Locomotive Co. Ltd. for one "BS" class engine cylinder and one boiler barrel plate and with the Steel Companies of Scotland Limited for 440 steel engine tyres.

Ransomes & Rapier Limited has received an order from the London Passenger Transport Board for three sets of hydraulic, single-cylinder type buffer stops for Edgware.

Ransomes & Rapier Limited has received an order from the L.N.E.R. for one 70-ft.-dia. Mundt type vacuum-operated locomotive turntable for installation at Ipswich.

Banting & Tresilian Limited has received an order from the I.S.R. Burma State Railways) Administration for 3,000 steel boiler tubes to be supplied to the inspection of Messrs. Rendel, Palmer & Tritton.

The Kofler Train Control Co. Ltd. has received an order from the Bulgarian State Railways Administration for the installation of the Kofler train control apparatus on the Sofia–Mezdra main line with equipment for 15 stations and four locomotives. An English company has now been formed and arrangements made with Tyer & Co. Ltd. for the manufacture of Kofler train control apparatus.

Tenders are invited by the Chief Railway Commissioner, Burma Railways, Rangoon, receivable by May 15, for the supply of one wheel lathe for turning 2 ft. 6 in. dia. metre-gauge locomotive wheels.

The Administration of the Central Railway of Brazil is calling for tenders, to be presented in Brazil by May 15, for the supply of a number of locomotives and wagons. Firms desirous of offering locomotives and wagons of United Kingdom manufacture can obtain further details from the Department of Overseas Trade, London, S.W.1. Reference number T.Y. 20972/39 should be quoted.

The Controller of Stores, East Indian Railway, is calling for tenders (Tender No. S/SP/943/A), for the supply and delivery of 49 spare locomotive boilers. Tenders endorsed "Tender No. S/SP/943/A for the supply of spare Locomotive Boilers," must reach the General Manager, East Indian Railway, Calcutta, India, by May 9. A copy of the schedule may be borrowed from the Department of Overseas Trade. The drawings referred to in the schedule may be inspected at the offices of Hodges Bennett Limited, 16, Victoria Street, London, S.W.1 (for the consulting engineers).

Howard Graham Limited has been formed to acquire from Mr. H. Clayton-Wright the exclusive manufacturing and sales rights of the Harris range of patented bushings and Torflex coupling and sleeve bush. Harris Products Corporation of America is supplying bushes to the railway, automobile, aircraft, and industrial trades, and Howard Graham Limited is already supplying considerable quantities every week to the same formulæ, there being upwards of 200 different designs for varying applications.

XUM

Railway Share Market

Pending further developments in the political situation and the forthcoming Budget statement there has been little disposition for the stock and share markets to become more active. The volume of business has, in fact, remained very small, and as a result lower prices have ruled, although no heavy selling pressure was reported.

Securities of the home railways moved closely with the day-to-day trend of markets and were not affected by the past week's traffics, which were roughly in accordance with expectations. Great Western ordinary was lower at 24¾. The preference stock declined to 75½ and the 5 per cent. guaranteed stock was 99½, while the 4 per cent. debentures were 92½. Southern preferred at 62¼ and the deferred stock at 12¾ were relatively steady, awaiting the result of the application to the Rates Tribunal for an increase in fares. The market is taking the view that on this decision is likely to turn the question whether there is a chance of the railway's deferred stock returning to the dividend list for the current year. Southern 5 per cent. preference was 86½.

Sentiment in regard to L.M.S.R. and L.N.E.R. issues was dominated by the prevailing market trend, and prices were unresponsive to indications of increasing activity in the heavy industries. General expectations are that the output of steel and pig iron will show a further increase this month, while the shipbuilding and allied industries are becoming better employed. L.N.E.R. first guaranteed stock was 66 and the second guaranteed 50. The yield on the last named is now 8 per cent., or nearly the same as that obtainable on L.M.S.R. 4 per cent. preference stock. L.N.E.R. first and second preference attracted very little attention at 24½ and 9¾ respectively, while the 5 per cent. debentures were 103½, the 4 per cent. debentures 81½ and the 3 per cent. debentures 60½. L.M.S.R. 4 per cent. preference was steady around 48, and the 1923 preference was 28½, while the ordinary stock went back to 12¼. The 4 per cent. guaranteed transferred around 76½, and the 4 per cent. debentures were quoted at 89. London Transport "C" was out of favour, awaiting the decision as to the application for higher fares, and the price has gone back to 66½, at which an attractive yield is offered on the basis of last year's 4 per cent. dividend. Other London Transport stocks were again inclined to make lower prices in sympathy with the trend in gilt-edged securities and other high-grade investments. The 4½ per cent. stock was lower at 106, and the 5 per cent. stock 114.

Argentine railway securities were again inactive, but very little selling was reported. The better trend in traffics has created a satisfactory impression, although the gains recorded in recent weeks have been below most estimates. Various of the preference and ordinary stocks had a steadier appearance, but there was some selling of the debentures and prices reacted rather sharply, B.A. Gt. Southern 4 per cent. debentures went back to 54½, B.A. & Pacific consolidated debentures to 29½ and Cordoba Central first debentures at 54. Elsewhere very few dealings were recorded in San Paulo, Antofagasta and Nitrate Rails. American railway shares have reacted sharply in accordance with the trend of Wall Street, but Canadian Pacific issues were relatively steady. French railway sterling bonds were inclined to improve.

Traffic Table of Overseas and Foreign Railways Publishing Weekly Returns

	Railways	Miles open 1938-39	Week Ending	Traffics for Week: Total this year	Traffics for Week: Inc. or Dec. compared with 1938	No. of Weeks	Aggregate Traffics to Date: Totals: This Year	Aggregate Traffics to Date: Totals: Last Year	Aggregate Traffics to Date: Increase or Decrease	Shares or Stock	Prices: Highest 1938	Prices: Lowest 1938	Prices: Apl. 19, 1939	Prices: Yield (See Note)
				£	£		£	£	£					
South & Central America	Antofagasta (Chili) & Bolivia	834	16.4.39	13,330	+ 200	15	206,690	258,980	− 52,290	Ord. Stk.	14	7¼	7	Nil
	Argentine North Eastern ..	753	15.4.39	9,094	+ 571	42	398,069	377,823	+ 20,246	,,	6½	2	4	Nil
	Argentine Transandine ..	—	—	—	—	—	—	—	—	A. Deb.	82	75	72½	5½
	Bolivar	174	Mar., 1939	4,600	− 200	13	11,700	11,900	− 200	6 p.c. Deb.	8	7	7	Nil
	Brazil	—	—	—	—	—	—	—	—	Bonds.	10	4	5½	91/16
	Buenos Ayres & Pacific ..	2,806	15.4.39	112,221	+ 12,779	42	3,652,299	3,702,982	− 50,683	Ord. Stk.	6½	3¼	3	Nil
	Buenos Ayres Central ..	190	1.4.39	$88,400	+ $7,800	40	$4,065,000	$4,714,300	− $649,300	Mt. Deb.	15½	8	14	Nil
	Buenos Ayres Gt. Southern	5,082	15.4.39	158,809	+ 15,012	42	6,028,287	6,341,252	− 312,965	Ord. Stk.	17518	8½	8½	Nil
	Buenos Ayres Western ..	1,930	15.4.39	59,429	+ 16,749	42	1,885,794	1,903,474	− 17,680	,,	12¾	5	6½	Nil
	Central Argentine	3,700	15.4.39	131,405	+ 23,440	42	4,901,765	5,118,406	− 216,641	,,	13¼	5¾	7½	Nil
	Do.	—	—	—	—	—	—	—	—	Dfd.	6	2½	3½	Nil
	Cent. Uruguay of M. Video	972	8.4.39	16,283	− 3,650	41	747,939	736,931	+ 11,008	Ord. Stk.	3	1¼	1½	Nil
	Cordoba Central	1,218	—	—	—	—	—	—	—	Ord. Inc.	3¾	¾	2	Nil
	Costa Rica	188	Feb., 1939	21,719	+ 2,952	35	177,211	197,323	− 20,112	Stk.	28	22½	22	87/8
	Dorada	70	Mar., 1939	14,300	− 100	13	40,400	46,800	− 6,400	1 Mt. Db.	105¼	104	103½	513/16
	Entre Rios	810	15.4.39	14,851	+ 3,983	42	650,523	598,237	+ 52,286	Ord. Stk	7¼	3½	4	Nil
	Great Western of Brazil ..	1,092	15.4.39	8,500	+ 2,800	15	162,500	125,000	+ 37,500	Ord. Sh.	3/-	1/-	1/4	Nil
	International of Cl. Amer. ..	794	Feb., 1939	$549,437	+ $72,140	8	$1,097,710	$964,438	+ $133,272	—	—	—	—	—
	Interoceanic of Mexico ..	—	—	—	—	—	—	—	—	1st Pref.	6d.	6d.	½	Nil
	La Guaira & Caracas ..	22¾	Mar., 1939	6,415	+ 1,320	13	15,820	14,675	+ 1,145	Stk.	8	6½	7½	Nil
	Leopoldina	1,918	15.4.39	16,932	− 399	15	311,303	287,754	+ 23,549	Ord. Stk.	4	1	2	Nil
	Mexican	483	14.4.39	$345,000	+ $25,500	15	$4,728,300	$4,700,600	+ $27,700	,,	¼	1/16	1/8	Nil
	Midland of Uruguay ..	319	Mar., 1939	8,943	− 1,388	39	82,558	88,303	− 3,745	,,	7/8	1/2	1/2	Nil
	Nitrate	386	15.4.39	5,123	+ 83	15	38,118	53,035	− 14,917	Ord. Sh.	52/9	19/16	15/8	61/8
	Paraguay Central	274	15.4.39	$2,879,000	+ $442,000	42	$125,908,000	$128,716,000	− $2,808,000	Pr. Li. Stk.	60	55½	47½	125/8
	Peruvian Corporation ..	1,059	Mar., 1939	69,598	− 10,836	39	609,165	740,756	− 131,591	Pref.	5¾	1¾	2	Nil
	Salvador	100	8.4.39	¢17,725	− ¢7,525	41	¢862,689	¢835,225	+ ¢27,464	Pr. Li. Db.	23	20	19½	Nil
	San Paulo	153½	9.4.39	25,948	− 475	14	395,168	442,166	− 46,998	Ord. Stk.	64	28	25½§	713/16
	Taltal	160	Mar., 1939	3,735	+ 2,450	39	27,530	31,955	− 4,425	Ord. Sh.	15/16	1/2	7/16	113/8
	United of Havana	1,353	14.4.39	27,974	− 3,670	42	970,396	1,058,104	− 87,708	Ord. Stk.	3⅝	1/2	1	Nil
	Uruguay Northern	73	Mar., 1939	852	− 145	39	9,110	8,478	+ 632	Deb. Stk.	2	1	2	Nil
Canada	Canadian National	23,772	14.4.39	703,106	+ 44,198	15	9,616,767	9,539,668	+ 77,099	—	—	—	—	—
	Canadian Northern ..	—	—	—	—	—	—	—	— 4 p.c.	Perp. Dbs.	72	60	69	515/16
	Grand Trunk	—	—	—	—	—	—	—	—	4 p.c. Gar.	104	90	97½	41/16
	Canadian Pacific	17,186	14.4.39	499,800	− 12,000	15	6,855,400	7,021,200	− 165,800	Ord. Stk.	87/16	41/4	4	Nil
India†	Assam Bengal	1,329	31.3.39	46,275	+ 1,500	52	1,524,605	1,403,562	+ 121,043	Ord. Stk.	81½	70	69½	45/16
	Barsi Light	202	31.3.39	5,595*	+ 2,093	52	138,750	138,382	+ 368	Ord. Sh.	60½	54¼	52½	7⅝
	Bengal & North Western ..	2,108	31.3.39	88,648	− 5,801	26	1,460,217	1,430,938	+ 29,279	Ord. Stk.	311	278	253	7⅛
	Bengal Dooars & Extension	161	31.3.39	2,943	− 824	52	146,504	146,225	+ 279	,,	89	83	85	7⅝
	Bengal-Nagpur	3,272	31.3.39	237,825	+ 4,512	52	7,093,337	7,113,590	− 20,253	,,	95½	90	85½	411/16
	Bombay, Baroda & Cl. India	3,085	10.4.39	259,650	− 15,075	2	259,650	274,725	− 15,075	,,	112716	95	101½	5⅞
	Madras & Southern Mahratta	2,967	31.3.39	175,425	− 29,384	52	5,653,513	5,411,504	+ 242,009	,,	108	97	95½	7⅞
	Rohilkund & Kumaon ..	571	31.3.39	19,067	− 3,678	26	276,897	288,418	− 11,521	,,	308	285	270	611/16
	South Indian	2,531¾	20.3.39	107,174	− 8,252	51	3,966,242	4,067,771	− 101,529	,,	104	101	100½	415/16
Various	Beira-Umtali	204	Feb., 1939	73,349	− 13,845	21	399,916	443,755	− 43,839	—	—	—	—	—
	Egyptian Delta	620	31.3.39	5,381	− 622	52	224,647	237,022	− 12,375	Prf. Sh.	7⅛	5/6	1/2	Nil
	Kenya & Uganda	1,625	Mar., 1939	279,634	− 4,596	13	782,935	823,885	− 40,950	—	—	—	—	—
	Manila	—	—	—	—	—	—	—	—	B. Deb.	49	41	40½§	85/8
	Midland of W. Australia ..	277	Feb., 1939	14,943	− 119	35	122,176	113,039	+ 9,137	Inc. Deb.	93¾	89	90½	47/16
	Nigerian	1,900	4.3.39	39,891	− 20,949	49	1,972,085	2,656,991	− 684,906	—	—	—	—	—
	Rhodesia	2,442¾	Feb., 1939	327,027	− 64,066	21	1,838,418	2,101,534	− 263,116	—	—	—	—	—
	South Africa	13,285	1.4.39	680,690	+ 60,282	1	680,690	620,408	+ 60,282	—	—	—	—	—
	Victoria	4,774	Jan. 1939	782,635	− 110,925	31	5,516,376	5,640,789	− 124,413	—	—	—	—	—

NOTE.—Yields are based on the approximate current prices and are within a fraction of 1/16

* Chaitri Fair. † Receipts are calculated @ 1s. 6d. to the rupee § ex dividend

The variation in Sterling value of the Argentine paper peso has lately been so great that the method of converting the Sterling weekly receipts at the par rate of exchange has proved misleading, the amount being over estimated. The statements are based on the current rates of exchange and not on the par value